

Euroanaesthesia 2025 The European Anaesthesiology Congress

Abstract Programme



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The ESAIC solicits the submission of abstracts for the Euroanaesthesia 2026 Congress Rotterdam, The Netherlands 06-08 June 2026

All abstracts must be submitted online via the
Euroanaesthesia website
The submission module will be available to
submitters as of Fall 2025

Submission Conditions

The submission conditions will be made available on the Euroanaesthesia website at least one month before opening of the submission system.

Abstracts

EUROANAESTHESIA 2025

The European Anaesthesiology and Intensive Care Congress



European Journal of Anaesthesiology

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Papers should be submitted online at: www.editorialmanager.com/eja.

European Journal of Anaesthesiology (ISSN: 0265-0215) is published monthly by Wolters Kluwer Health, Inc. and distributed in the US by Mercury Airfreight International, Inc., 365 Blair Road, Avenel, NJ 07001. Periodicals postage paid at Rahway, NJ. POSTMASTER: send address changes to European Journal of Anaesthesiology, PO Box 1610, Hagerstown, MD 21740, USA.

All correspondence should be addressed to the Editorial Office: European Journal of Anaesthesiology, Lippincott Williams & Wilkins, 8th Floor, 30 Churchill Place, Canary Wharf, London, E14 5RE, UK **Publisher** Daniel Hyde

Production Editor Duncan Martin-Holloway

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Euroanaesthesia 2025

The European Anaesthesiology Congress

LISBON, PORTUGAL, 25 - 27 MAY 2025

ABSTRACT PRESENTATION PROGRAMME

Please note that all abstracts are presented as poster presentations: abstract presenters do not make a formal presentation of their abstract in a separate room, using audiovisual aids (except for the Best Abstract Prize Competition). Instead, two chairpersons will conduct, in front of each poster, a short discussion of each abstract with the presenter and the audience, for every abstract in that session. Poster presenters have been asked to stand by their poster at least 15 minutes before the start of the session and 15 minutes after, to address further questions.

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ESAIC Best Abstract Prize Competition (BAPC)

BAPC-01

Spain

Epidemiological trends of acute respiratory distress syndrome in the 21st century: a nationwide, population-based retrospective study

M. Bardají Carrillo^{1,2}, L. Alonso-Villalobos¹,

E. Gómez Pesquera^{1,2}, R. López-Herrero^{1,2}, A. García-Concejo², E. Tamayo^{1,2} ¹Clinic Universitary Hospital of Valladolid, Anaesthesiology and Critical Care, Valladolid, Spain, ²BioCritic, Group for Biomedical Research in Critical Care Medicine, Valladolid,

Background and Goal of Study: Acute respiratory distress syndrome (ARDS) is a prevalent respiratory condition associated with significant mortality. Current literature on ARDS epidemiology reports a wide range of incidence (7.2-78.9/100,000 population/year), hospital mortality (32-51%) and associated costs (\$8,476-\$547,974). We analyzed the epidemiological trends of ARDS in Spain from 2000 to 2022 using the Minimum Basic Data Set (MBDS), focusing on ARDS incidence, associated mortality, and economic impact.

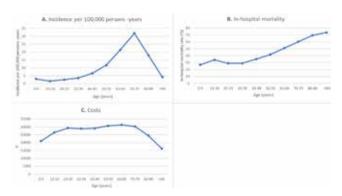
Materials and Methods: We conducted a nationwide, population-based retrospective study of all hospitalizations for ARDS in all Spanish hospitals from January 1, 2000, to December 31, 2022, using MBDS records, which have an estimated coverage of 99.5%. The study reports ARDS incidence per 100,000 population/year, hospital mortality rate, and mean cost per patient.

Results and Discussion: We analyzed 93,192 records of patients with a new diagnosis of ARDS during the study period. ARDS incidence ranged from 2.96 to 20.14/100,000 population-years, peaking in 2021 during COVID-19 pandemic, and being around 10/100,000 during most of the study like reported by other European studies in that period. The variability in ARDS incidence in our study is probably due to changes in the International Classification of Diseases coding and in ARDS diagnostic criteria.

Mortality ranged between 38.0% and 55.0%, showing a declining trend, which may be attributed to advancements in ARDS treatment and the implementation of lung-protective mechanical ventilation, and has lately stabilized around 40-45%.

Cost per patient increased throughout the study period, stabilizing in late years around 30,000€ to 40,000€ after reaching a peak of 42,812€ in 2011. These costs are comparable to the ones reported by other European studies.

Incidence, mortality and costs by age group are depicted in the figure.



Conclusions: This is the largest epidemiological study on ARDS in Europe. ARDS incidence has stabilized in recent years, with mortality declining to 40-45%. ARDS-related costs have increased nearly four-fold. Research using MBDS data could enhance ARDS understanding and guide future studies.

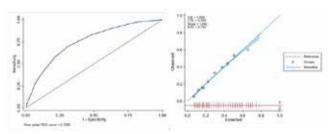
BAPC-02

Development and validation of a score to predict postoperative intensive care unit admission after non-cardiac surgery

R. M'Pembele¹, T. Tenge¹, S. Roth¹, A. Stroda-Hartmann¹, J. Larmann², G. Lurati Buse¹, MET-REPAIR Investigators ¹University Hospital Duesseldorf, Department of Anaesthesiology, Düsseldorf, Germany, ²University Hospital RWTH Aachen, Department of Anaesthesiology, Aachen, Germany

Background and Goal of Study: Intensive care unit (ICU) capacities after non-cardiac surgeries are limited. As both numbers of high-risk surgeries performed and comorbidity burden are rising, an efficient resource management strategy is crucial to avoid overtreatment without increasing rates of postoperative complications. To date, there are no convincing tools available to support decision making for postoperative need for ICU admission. This study reports the development and internal validation of the PREDICT-ICU score.

Materials and Methods: This is a secondary analysis of the MET-REPAIR international cohort study which recruited patients ≥45 years with increased cardiovascular risk undergoing non-cardiac surgery. The primary endpoint was postoperative elective or unplanned ICU admission. Preoperative variables were chosen based on clinical relevance. Lasso logistic regression with internal cross validation was performed for predictor selection. Variables with the greatest impact were chosen based on their coefficients. Predictor selection for the PREDICT-ICU score was confirmed in a second lasso logistic regression. Model and score performances were tested using ROC-AUC and calibration curves.



Results and Discussion: The total dataset contained 15,600 patients with complete data. 4,342 (27.8%) of these patients had a postoperative ICU admission (3,850 planned, 492 unplanned). The full model including 14 variables showed moderate to good discrimination and calibration (ROC-AUC 0.75 95% CI 0.74-0.76, Calibration slope 1.000).

The PREDICT-ICU score contains the following variables and score points: High surgical risk (10), duration of surgery \geq 150 min (10), ASA class \geq 3 (7), severe valve pathology (5), history of can-

cer (4), history of coronary artery disease (2). The PREDICT-ICU score showed similar performance as compared to the general model (ROC-AUC 0.75 95% CI 0.74-0.76, Calibration slope 1.000). **Conclusion(s)**: The PREDICT-ICU score including six preoperative variables is a tool that can predict postoperative ICU admissions in patients undergoing non-cardiac surgery. The score might help improving resource management and should be externally validated.

BAPC-03 Saving or not saving an 80-year-old isn't just a question of age

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Background: An average patient is already older than a research subject.

Case Report: With the case of an 82-year-old retired lady who had always been active despite her age and suffered from head trauma, a clinical dilemma was raised. She was on apixaban for atrial fibrillation. A CT scan after the fall quickly confirmed an epidural brain hematoma threatening her life.

Indication for an emergency craniotomy and apixaban, taken the same morning, increases the risk of uncontrollable bleeding. Time was critical, and despite her advanced age, she gets andexanet alfa, a reversal agent for apixaban. Within minutes of the infusion, her clotting began to stabilize. The surgical team moved swiftly to drain the hematoma.

Hours later, she emerged from surgery, weak but stable. The bleeding had stopped. The goal was achieved over the next few days as she recovered in the ICU.

Discussion: This was a significant ethical and clinical dilemma, highlighting the challenge of treating older patients, mainly because medical researches are often based on data from younger populations (like 60-year-olds). Older patients (over 80) in clinical trials are frequently underrepresented, mainly because of more complex health conditions, multiple medications, and decreased physiological reserve. Yet, as the population ages, the medical community increasingly encounters older patients who could benefit from treatments but for whom we need more evidence of safety and efficacy. We risk denying them potentially life-saving interventions based on their age, which raises ethical questions about fairness and equal access to care.

Learning points: Doctors can assess each patient individually and consider factors such as overall health, frailty, cognitive function, and life expectancy beyond the immediate illness.

The solution is not to deny treatment to older patients but to take a more nuanced, patient-centered approach. Research on younger populations provides a foundation, but in real-world practice, clinicians must adapt this knowledge and tailor treatments. Saving or not saving an 80-year-old isn't just a question of age—it's a question of the person's overall health, values, and potential for meaningful recovery.

BAPC-04

Al-driven predictions: tackling postoperative delirium with the Swiss Safe Brain Initiative data

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Background and Goal of Study: Postoperative delirium (POD), a common complication of surgery and anaesthesia, increases morbidity, mortality, and healthcare costs. The Safe Brain Initiative (SBI) care bundle comprises 18 non-pharmacological measures to enhance perioperative brain health. This study aims to develop and validate a predictive model for POD using pre-induction features from the SBI dataset, comparing it to a known model (PIPRA).

Materials and Methods: The study used an anonymized dataset of 1,419 observations from a private hospital, reduced to 600 cases after excluding patients <60 years or undergoing intracranial/cardiac surgeries. Seventy pre-induction features were included, such as anaesthesia type, pain levels, and preventive measures. POD was defined as a Nu-DESC score ≥ 2. Logistic regression with SMOTE and XGBoost models were developed for binary classification. Feature importance and SHAP values were analyzed to enhance interpretability.

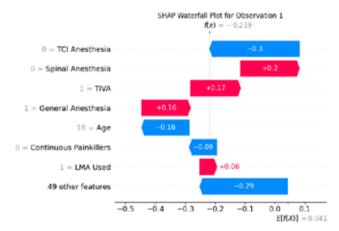


Figure 1: SHAP waterfall plot displaying the 7 most important features and their effects on model prediction for observation 1.

Results and Discussion: Key predictors included anesthesia type (spinal/general), intubation, surgical subspecialty, and pain perception. Environmental factors like noise reduction and temperature monitoring also improved predictions. The logistic regression model with SMOTE achieved the best performance (AUC: 0.792,

Sensitivity: 0.919), outperforming the model described in PIPRA (AUC: 0.789, Sensitivity: 0.856) trained on our data. XGBoost performed slightly lower (AUC: 0.772, Sensitivity: 0.902).

Conclusion(s): This study demonstrates the potential of Al-based predictive tools to identify POD risk preoperatively, enabling early non-pharmacological interventions. Integrating such models into clinical practice can improve perioperative brain health and patient outcomes.

References:

PIPRA: Dodsworth BT, et al. Age Ageing. 2023;52:1-10. Meco et al. A first assessment of the safe brain initiative care bundle for addressing postoperative delirium in the postanesthesia care unit. J Clin Anesth. 2024

BAPC-05

Plasma biomarkers of inflammation are associated with neurocognitive disorders two years after anaesthesia and surgery

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Background and Goal of Study: Circulating biomarkers of inflammation are associated with postoperative delirium, however the association with postoperative Neurocognitive Disorders (NCD) has received little attention.

The aim of this study was to assay inflammatory biomarkers (IL-6, IL-10, IL-18) and investigate associations with NCD.

Materials and Methods: After ethics approval and informed consent, we analysed plasma biomarkers of 62 participants who had also undergone cognitive assessments. Plasma was taken at baseline, and at 30 min, 6, 24, and 48h after incision. Proteomic assays were processed on a multiplex biomarker assay platform using electrochemiluminescence. Postoperative NCD was assessed using 8 cognitive tests in addition to functional and subjective assessments.

Major and mild NCD were defined according to current nomenclature and combined to yield a composite NCD outcome at 3 months and a longer term assessment at 28.7 (8.7) [mean (SD)] months.

To analyse the association between biomarker change and subsequent cognition we used linear mixed-effects models.

Results and Discussion: 63 participants were assessed at 3 months and 46 at long term follow-up. At 3 months 18/63 (28.6%) participants and at long term 17/46 (37%) were classified as NCD. Plasma IL-6 and IL-10 significantly increased and IL-18 significantly decreased over the sampling period (Fig 1).

Participants with long term NCD had a significant increase in IL-6 levels at 24 hours (p=0.04) (Fig 2).

Conclusion(s): Approximately one third of older subjects demonstrated NCD at 3 months and 2 years. IL-6 and IL-10 increase along different time courses in the immediate perioperative period. IL-6, which peaks at 24 hours is associated with long term NCD.

This opens up the possibility of assaying IL-6 to use as a screening test for long term NCD after anesthesia and surgery.

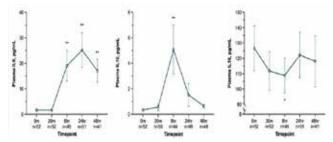
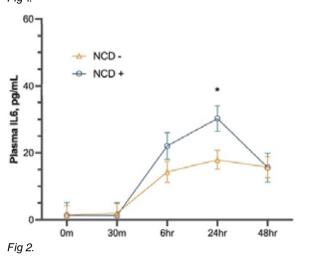


Fig 1.



BAPC-06

Lung aeration following PEEP individualization during laparoscopic surgery in obese patients: A secondary analysis of the PEEP LAP study

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Background and Goal of Study: Intraoperative protective ventilation is a strategy to minimize lung injury during surgery. However, recommendations on PEEP settings remain inconsistent. In obese patients, high PEEP may prevent atelectasis; however, evidence of its effect on postoperative complications is limited, likely due to the need for individualized PEEP based on lung mechanics. This study explores the effect of PEEP, set with the Recruitment-to-Inflation Ratio (RIR) maneuver, on lung aeration in obese patients undergoing laparoscopic/robotic surgery.

Materials and Methods: We recruited adult obese patients (BMI ≥ 30 kg/m2) who underwent laparoscopic or robotic abdominal/pelvic surgery. Volume-controlled ventilation (6-7 ml/kg IBW) was used. PEEP was set according to RIR. Electrical impedance tomography (EIT) was performed at five timepoints: pre-intubation, post-intubation, post-pneumoperitoneum, post-Best PEEP, and post-extubation. Global inhomogeneity index (GI), Regional Ventilation Delay (RVD), and regional aeration were analyzed.

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Results and Discussion: Among 32 patients screened (January-September 2024), 20 were analyzed. Of these, 35% were high recruiters (RIR > 0.5), Median PEEP was 7.5 cmH₂O (5-12.25): 5 cmH₂O (5-7) in low recruiters and 15 cmH₂O, (12-16.5) in high recruiters. Airway opening pressure was observed in 35% of patients (8 cmH₂O, 7.5-10). Lung inhomogeneity worsened intraoperatively (RVD: 10% to 11.76%; GI: 55.61% to 79%) but returned to baseline after extubation (RVD: 9.7%; GI: 55.67%). High recruiters exhibited greater inhomogeneity at baseline and post-extubation but showed the most significant improvement after PEEP (GI: 81% to 68.2%), with notable recovery in dorsal-mediodorsal aeration. In contrast low recruiters had smaller changes and regional aeration was less affected by mechanical ventilation. Patients with compliance improvement after Best PEEP (75%) showed better RVD (7.93% vs. 11.54%), GI (66.58% vs. 84.20%), and dependent zone aeration (38.33% vs. 17.6%), highlighting the protective role of individualized PEEP. Interestingly, we found a substantial normalization of GI, RVD and dorsal-mediodorsal aeration to the preoperative values in most patients in our cohort.

Conclusion(s): Individualized PEEP based on RIR improves lung aeration and reduces inhomogeneity, particularly in high recruiters, emphasizing the role of tailored ventilation strategies in preventing atelectasis during surgery.

Perioperative Care

10AP01-2

A late-onset case of congenital central hypoventilation syndrome (CCHS) with the PHOX2B gene mutation after exposure to general anesthesia

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Background: Congenital central hypoventilation syndrome (CCHS) is a very rare disease characterized by apnea or hypoventilation during sleep. This disease is caused by the failure of brainstem autonomic control of ventilation due to PHOX2B gene mutation!

Although patients typically present with CCHS as newborns and rarely in later infancy, there have been several reports of patients presenting with CCHS in adulthood. This is called late-onset CCHS (LO-CCHS), which may be triggered by severe respiratory infection or exposure to sedatives or general anesthesia².

Case Report: We report a case of 59-years-old woman who was diagnosed LO-CCHS after general anesthesia. She was diagnosed with unexplained carbon dioxide narcosis after receiving treatment for pneumonia and heart failure and was wearing continuous positive airway pressure (CPAP) at night. She was subsequently diagnosed with bilateral breast cancer. She got bilateral mastectomy under general anesthesia.

After surgery, she returned to consciousness, but remained apnea, therefore she entered ICU without extubation. A day after the surgery, she was extubated, but she became hypoventilation and showed desaturation during sleep. Arterial carbon dioxide tension (PaCO₂) increases progressively with severe respiratory acidosis, somnolence, and coma. She was reintubated and then tracheostomy was performed. Later, genetic analysis revealed a mutation in the PHOX2B gene, and she was diagnosed with LO-CCHS.

Discussion: In cases of LO-CCHS, most patients report having had some symptoms since childhood, and they have parents with a history of CCHS. Symptoms of right-sided heart failure are generally observed at the time of diagnosis, and nocturnal noninvasive ventilation is frequently indicated.

These presentations involve cardiac rhythm disturbance, transient asystole, decreased heart rate variability. In this case, she frequently became bradycardia and lost consciousness, so she underwent pacemaker implantation.

Patients who may be suspected of LO-CCHS, which is triggered by sedatives or general anesthesia, should be avoid general anesthesia if possible.

References:

- 1. Weese-Mayer DE et al. Am J Respir Crit Care Med. 2010;181:626-44.
- 2. Basu SM et al. Anesth Analg. 2017;124:169-178.

Learning Points: Anesthesiologists need to include undiagnosed LO-CCHS in the differential diagnosis of patients with unexplained postoperative respiratory depression.

10AP01-4

GIP/GLP-1 Co-agonist is not associated with higher risk of aspiration pneumonia compared to GLP-1 agonists

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Background and Goal of Study: Glucagon-like peptide-1 agonists (GLP-1a) can delay gastric emptying, raising concerns about the risk of pulmonary aspiration during elective procedures and surgeries. Despite this, the American Society of Anesthesiologists (ASA) recently updated its guidance, allowing most patients to continue GLP-1a therapy before surgery. Tirzepatide, a glucose-dependent insulinotropic polypeptide (GIP)/GLP-1 co-agonist, has shown superior efficacy in weight loss and glycemic control compared to GLP-1a. However, it remains unclear whether tirzepatide poses a greater risk of aspiration pneumonia than GLP-1a.

This study evaluated the risk of aspiration pneumonia in patients using GIP/GLP-1 co-agonist versus GLP-1a during endoscopy and ambulatory surgery.

Materials and Methods: We performed a retrospective, propensity-score-matched cohort study using the TriNetX Database. We included adult (age≥18) patients with either type 2 diabetes (T2DM) or obesity who underwent endoscopy or ambulatory surgery. Patients in the GIP/GLP-1a and GLP-1a cohorts had at least two prescription refills within one year before the index procedure

The primary outcome was the incidence of aspiration pneumonia within 14 days post-procedure. The secondary outcome was the incidence of acute respiratory failure. Covariates included demographics, BMI, HbA1c, comorbidities, and use of T2DM and GI medications.

Propensity score matching was used with a standardized mean difference of <0.1 to indicate balanced covariates. Risk estimates were calculated using logistic regression on the TriNetX platform, and risk ratios were reported. Statistical significance was set at p < 0.05.

Results and Discussion: After matching, each cohort included 4,627 patients, and all covariates were balanced. The incidence of aspiration pneumonia did not differ significantly between the GIP/GLP-1a and GLP-1a cohorts (Risk ratio 0.69 [95% CI 0.43–1.11]). Similarly, no significant difference was observed in acute respiratory failure rates (Risk ratio 0.91 [95% CI 0.49–1.68]).

These findings suggest that GIP/GLP-1 co-agonist is not associated with a higher risk of aspiration pneumonia or acute respiratory failure compared to GLP-1a in patients undergoing elective procedures.

Conclusion(s): The risk of post-procedure aspiration pneumonia did not differ between patients using GIP/GLP-1 co-agonist and those using GLP-1a before endoscopy and ambulatory surgery.

10AP01-5

GLP-1 analogs do not associate with increased aspiration pneumonia compared to DPP-4 inhibitors in ambulatory surgery

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Background and Goal of Study: The use of glucagon-like peptide-1 agonists (GLP-1a) has raised concerns about a potential increase in aspiration pneumonia during surgery. Many hospitals follow the American Society of Anesthesiologists (ASA) 2023 guidance to hold GLP-1a before elective procedures. However, this guidance does not apply to dipeptidyl peptidase-4 inhibitors (DPP-4i), which also act on the GLP-1 pathway. Whether GLP-1a presents a higher risk of aspiration pneumonia compared to DPP-4i during ambulatory surgeries remains unclear.

This study aimed to investigate the incidence of aspiration pneumonia in patients using GLP-1a versus DPP-4i after ambulatory surgeries.

Materials and Methods: We conducted a retrospective cohort study using the TriNetX Database. Adult (age ≥18) patients with either type 2 diabetes (T2DM) or obesity who underwent 1-day ambulatory surgeries were included. The GLP-1a and DPP-4i cohorts consisted of patients with at least two prescription refills within one year and who continued medication use within 1 month prior to surgery. The primary outcome was the incidence of aspiration pneumonia within 14 days post-surgery. Secondary outcomes included aspiration pneumonitis and acute respiratory failure. Covariates included demographics, BMI, HbA1c, comorbidities, and T2DM and GI medications. Propensity score matching was performed, with a standardized mean difference of <0.1 indicating balanced covariates. Risks were estimated and compared using a logistic regression model on the TriNetX platform and reported risk ratio (RR). A p-value < 0.05 was considered statistically significant.

Results and Discussion: After matching, each cohort included 4,831 patients with balanced covariates. The risk of aspiration pneumonia in the GLP-1a cohort was similar to the DPP-4i cohort (RR: 0.93, 95% Cl: 0.61-1.43). No significant differences were observed in the rates of aspiration pneumonitis (RR: 0.71, 95% Cl: 0.32-1.61) or acute respiratory failure (RR: 0.71, 95% Cl: 0.42-1.19). Our findings suggest that GLP-1a use was not associated with an increased risk of aspiration pneumonia compared to DPP-4i following ambulatory surgeries.

Conclusion(s): The risk of post-surgery aspiration pneumonia did not differ between users of GLP-1a and DPP-4i undergoing ambulatory surgeries. Further research is warranted to guide an individualized approach to GLP-1a management during the perioperative period.

10AP01-6

Should we divide the preoperative ASA 2 group into smaller subgroups to better evaluate our patients?

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Background and Goal of Study: The preoperative ASA 2 group is very heterogeneous having patients from different ages. All the preoperative scores evaluate patients for the postoperative period; however, the intraoperative period is more important e.g. hindering hypotension. Patients' reactions to our anesthetic drugs represent their general conditions. Propofol is a drug that can cause hypotension, so it is automatically decreased by anesthetists in elderly patients. More studies have already focused on a new drug, ciprofol, that causes more stable hemodynamic parameters in elderly patients (1).

Materials and Methods: We analyzed retrospectively patients' preoperative data and their anesthesia induction parameters. We aimed to search for parameters that might differentiate between young and old ASA 2 patients' groups with different general conditions. A young (Group I, age < 40 years) and an elderly (GII, age > 70 years) ASA 2 group was created on the age scale of our examined patients. Patients' ASA scores and two other score points (Charlson Comorbidity Index /CCI/ and Possum-P /PP/ score) were compared with patients' induction parameters. Statistical analysis was performed with the SPSS program, significance level was p<0.05. Ethical Approval Nr: 9337-PTE 2022.

Results and Discussion: The two groups (80-80 patients) differentiated significantly in the administered propofol dosage/bodyweight (Gl: 2.9 ± 0.9 mg vs GlI: 2.39 ± 0.7 mg, p= 0.016) and in the post-induction blood pressure drop (Gl: 20 ± 12 mmHg, GlI: 34 ± 17 mmHg, p< 0.001). Based on their CCI and PP scores we realized significant differences in their total score and the predicted mortality/morbidity percentage, proven by the frequency of the postoperative complications. However, as we compared the subparameters of the score systems, a significant difference was visible only in the cardiac function and the kidney parameters (CN Gl: 4 ± 1 , GlI: 7 ± 3 mmol/I, p=0.02) besides age.

Conclusion(s): We differentiated two in their parameters significantly different groups within the ASA 2 patients based on their age. Parameters representing patients' age and frailty need to be identified and a new score system should be designed to predict intraoperative management difficulties.

References:

1. Chen, W. et al. A meta-analysis and systematic review based on perioperative management of elderly patients: is ciprofol an alternative to propofol?. Eur J Clin Pharmacol (2024). https://doi.org/10.1007/s00228-024-03782-7

10AP01-7 Perioperative hyperlactatemia: can it just be shivering?

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Postoperative hyperlactatemia is a marker of physiological stress after surgical procedures. While lactic acidosis is associated with high mortality, isolated serum lactate increase is a condition with poorly understood underlying causes and prognosis. We present a clinical case of substantial increase in postoperative lactate, possibly due to shivering.

A 74-year-old male patient was admitted to PACU immediately after a radical cystoprostatectomy with ileal conduit urinary diversion in the context of bladder neoplasm. He had a personal history of hypertension, atrial fibrillation, dyslipidemia, diabetes, grade I obesity, and sleep apnea. Preoperative haemoglobin was 11.9 g/dL. An intravenous general anaesthesia was performed. He was initially scheduled for laparoscopic surgery, but surgical technical difficulties arose in prostate dissection, leading to a small rectal laceration and a conversion into infra-umbilical laparotomy. Although total estimated bleeding losses were 1500 mL, serial arterial blood lactates range was 0.7-1mmol/L. There was no need for vasopressors and normothermia was maintained. The patient arrived in PACU conscious, haemodynamically stable, normothermic, and painless. Approximately 60 minutes after admission, an episode of shivering occurs and was treated with meperidine. In a new arterial blood gasometry, there was a substantial and isolated increase in lactates (maximum 8mmol/L). The patient was promptly evaluated by his surgeon to exclude surgical complications. Venous blood sample confirmed haemoglobin of 9.9g/dl and normal CK, LDH, and ionic balance. Lactates returned to baseline after 5 hours (minimum 1.9mmol/L). During hospitalization, the patient maintained a subfebril temperature. although with a declining CRP and no need for antibiotherapy. He was discharged on the 8th postoperative day.

Postanaesthetic shivering is a common event and a major contributor to patient discomfort in the postoperative setting. It is associated with increased metabolic demand and oxygen consumption, which can be the basis to explain transient postoperative hyperlactatemia. Nevertheless, it is essential to exclude other underlying causes of postoperative hyperlactatemia.

- Postoperative hyperlactatemia should be promptly investigated to determine a differential diagnosis of benign and pathological causes
- Postanaesthetic shivering is associated with a catabolic state and therefore can explain transient postoperative hyperlactatemia.

10AP01-8 Instant coffee flavor product for abbreviation of pre-operative fasting

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Background and Objective of the Study: The study addresses the importance of abbreviating the traditionally long preoperative fasting period, which brings adverse effects such as thirst, hunger, and anxiety for patients. Based on protocols like ERAS and ACERTO, the research aims to develop and characterize an instant coffee-flavored product enriched with carbohydrates and free of caffeine. This product is designed to be consumed up to two hours before elective surgeries to reduce the discomfort caused by prolonged fasting and improve patient well-being.

Materials and Methods: The study involved the development of a preoperative product composed of carbohydrates and decaffeinated coffee, meeting the criteria for clear liquids, alongside the presentation of its nutritional information. Analyses were conducted to determine the product's moisture, ash, protein, fat, dietary fiber, carbohydrate, and mineral (sodium) content to create its nutritional table. Microbiological quality was ensured through tests for the identification of *Salmonella* spp. and *Escherichia coli*.



Results and Discussion: The formulation, registered under number BR102022022016-6 with the National Institute of Industrial Property, has a hypercaloric composition of 296.12 kcal per 78.53 g serving, free of fat, gluten, and lactose. Microbiological tests confirmed sanitary compliance, with no detection of Sal-

monella spp. or Escherichia coli. The product is characterized as an instant coffee-flavored powder recommended for preparation by dissolving the contents in 200 ml of water at 60°C. This solution can be consumed up to two hours before the surgical procedure.

Conclusion: The development of the instant coffee-flavored product proved to be a viable solution for abbreviating preoperative fasting while meeting the nutritional needs of patients. Its hypercaloric composition reinforces its practical applicability in hospital settings. These results suggest that the product can contribute to improving patient well-being and perioperative experience, aligning with evidence-based protocols such as ERAS and ACERTO.

10AP01-9

Barcelona, Spain

Improving adherence to Multimodal Prehabilitation: what do patients say?

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Background and Goal of Study: Multimodal prehabilitation (MP) programs (exercise, nutrition, anxiety reduction) have been developed to enhance patients' physical and mental status before surgery, although adherence remains a challenge. Maintaining adherence during a short pre-operative period of 4 weeks is crucial to maximizing program effectiveness. Aim of the study was to better understand patients' perspective of MP and to identify factors related to program adherence.

Materials and Methods: A qualitative descriptive study was conducted over a 9-month period with patients scheduled for complex cancer surgery who were enrolled in a MP program at a tertiary university hospital. Data were collected with an anonymous, voluntary, structured questionnaire designed to evaluate the MP program. Patients were excluded if they were unable to complete the survey due to illiteracy, language, cognitive impairment, or visual/hearing deficits.

Results and Discussion: From a total of 163 consecutive prehabilitated adult patients awaiting major gastrointestinal, urological, gynaecological surgeries, 131 met inclusion criteria and were asked to fill in the form at the end of the program with a response rate of 55% (72 patients, 55.5 % male, mean age 71.5 ys). 94.4% of participants were unfamiliar with the concept of prehabilitation but 97.2% were interested in it after explanation. 93 % had never attended a gym nor had nutritional or psychological support before. Medical recommendation increased willingness to participate, while number of visits was a potential barrier to participation. All the patients were very satisfied with the program and will recommend it (mean Likert score 9 out of 10). Patients particularly enjoyed the supervised training and psycho-educative group

sessions. Primary motivating factor for participation was the desire to be "strong for surgery". Patients reported learning "healthy habits to help you live longer". 21% of patients expressed interest in continuing the program postoperatively. The biggest barrier to participation was related to transportation.

Conclusion(s): These findings highlight the importance of making Multimodal prehabilitation programs more patient-centred. Effective therapeutic strategies should be designed to align with patients' expectations, adding value to the surgical process and improving adherence to the program.

Acknowledgements: I would like to thank all the MP team members for the their enormous effort and dedication.

10AP01-10

Impact of frailty on postoperative complications during Multimodal Prehabilitation in patients scheduled for radical cystectomy due to bladder cancer

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Background and Goal of Study: Multimodal prehabilitation (MP) is designed to enhance patients' physical and mental capacity before complex surgeries, aiming to minimize postoperative complications, improving outcomes. Frailty is highly prevalent in cancer patients and should be routinely assessed and addressed through MP. The aim of this study was to analyse the prevalence of frailty and its impact on postoperative outcomes in prehabilitated patients scheduled for radical cystectomy due to bladder cancer.

Materials and Methods: Over a 4-week period before surgery, patients received personalized physical training, nutritional and psychological support from a multidisciplinary team. The Short Physical Performance Battery (SPPB), 6-Minute Walk Test (6MWT), handgrip strength, International Physical Activity Questionnaire (IPAQ), and maximal inspiratory pressure (MIP) were assessed before and after MP. Patients with an SPPB score < 7 were considered frail. Non-frail patients performed home-based training, while frail patients underwent supervised in hospital training twice a week. Anaemia was treated if haemoglobin (Hb) < 13 g/dL. Postoperative complications within 90 days were recorded.

Results and Discussion: A total of 28 consecutive prehabilitated patients were enrolled over an 8-month period (75% male, mean age 71.6 years, all ASA III, 29.6% non-smokers). Of these, 25% were classified as frail (57.1% male). Baseline mean values for G1 (frail) and G2 (non-frail) were: 6MWT (m) was 79.2 vs 102.5 (p=0.002), handgrip (kg) 24 vs 33.6 (p=0.023), MIP (cmH $_2$ O) 39 vs 91.5 (0.004), 85.7% of G1 patients had a low IPAQ score, Hb (g/dL) 10.1 vs 13.4 (0.001). All frail patients were iron-deficient and were treated with IV iron and 28.6% of them required transfusion before surgery. Values after MP were not significantly different

among groups. In the frail group, one patient visited the ER postoperatively, one patient required a reoperation and one patient died. G1 patients did not experienced significantly more postoperative complications compared to G2 patients. LOS was similar among groups.

Conclusion(s): In this study, the prevalence of frailty among our patients was 25%. Frail patients showed improvement in their baseline values before surgery.

The findings highlight that frail patients with bladder cancer who underwent radical cystectomy did not experience significantly more postoperative complications compared to non-frail patients after multimodal prehabilitation.

10AP01-11

Development of Remote Photoplethysmography (rPPG) technology for blood pressure and hemoglobin level assessment in the preoperative assessment setting

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Background and Goal of Study: There are various studies about noninvasive, remote photoplethysmography (rPPG)-based measurement of blood pressure (BP) and hemoglobin (Hb) concentration. Most studies are on healthy subjects with similar skin tones. There is limited data on rPPG BP and Hb measurements in patients with medical comorbidities and diverse skin tones.

The aim was to develop a model for non-invasive rPPG systolic BP (SBP), diastolic BP (DBP) and Hb measurements in diverse patient populations, which could be used for telemedicine-based preoperative evaluation.

Materials and Methods: The study was conducted at Singapore General Hospital from 1 March 2023 to 28 June 2024. 200 patients with a mean age of 56.4 years participated. 47.5% had comorbid conditions such as hypertension. Each group had a range of skin tones according to the Monk Skin Tone scale. Reference readings were measured with the Welch Allyn Connex[®] Vital Signs Monitor 6000 Series[™].

Simultaneously, vital signs were captured using rPPG technology via a laptop and webcam-based facial scan. Hb concentration was derived from the rPPG scans.

The primary analysis compared rPPG SBP and DBP measurements with measurements using automated blood pressure measuring devices. The secondary analysis compared rPPG Hb measurements with laboratory measurements.

Results and Discussion: Mean absolute percentage error (MAPE) for rPPG systolic BP and diastolic BP measurements were 9.52 and 7.52%. The mean difference between rPPG and reference measurements for SBP and DBP was 2.68 and 0.15 mmHg, standard deviation (SD) 7.86 and 3.22 mmHg. The model showed greater accuracy in predicting DBP than SBP. The 95% confidence interval for the mean difference between measurements was: SBP [1.153, 3.825]; DBP [-0.426, 0.726]. Our model predicted Hb with a MAPE of 8.52% and SD 0.74 g/dL. The mean predicted Hb was 12.71 g/dL (SD 1.13 g/dL), compared to the reference Hb of 12.95 g/dL (SD 1.81 g/dL). The mean difference was 0.23 g/dL (SD 0.67 g/dL). Strongest performance was noted in the mid-quartile ranges for DBP and Hb.

Conclusion(s): Our study is the first to evaluate contactless rPPG BP and Hb measurements in a population with varying skin tones and medical comorbidities. rPPG offers a scalable, contactless solution for vital signs monitoring. Further research could expand its utility and transform preoperative and chronic care through telehealth innovations.

10AP01-12

Splenectomy in secondary refractory Haemophagocytic lymphohistiocytosis in patient with severe thrombocytopenia - a perioperative challenge

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Background: Haemophagocytic lymphohistiocytosis (HLH) is a syndrome of severe immune activation and dysregulation rarely present in adults, usually secondary to a rheumatologic, infectious, or malignant disease(1). Common clinical features include fever, splenomegaly, cytopenias, hemophagocytosis, and coagulopathy(2). Seldom presented to the anesthesiologist, treatment is primarily medical and when refractory, splenectomy may be performed. Perioperative management and optimization in a multidisciplinary approach is fundamental with anesthesiology playing a key role.

Case report: 74 y.o. man, ASA IV proposed for therapeutic and diagnostic open splenectomy for refractory HLH secondary to suspected splenic lymphoma. He presented with severe thrombocytopenia (7x10^9/L), anemia (9,8g/dL), coagulopathy and acute renal injury. We performed a multidisciplinary evaluation with surgical team, ICU physicians and hemotherapy opting for prior splenic embolization. A TIVA was performed, with invasive arterial monitorization and a central venous line. Due to blood losses of 1,7L, anemia and coagulopathy treatment were guided by rotational thromboelastometry. Despite our effords, the patient remained in the ICU intubated under controlled mechanical ventilation, continuous dialysis and with increasing vasopressors passing away 4 days after surgery.

Discussion: Evidence for splenectomy in refractory HLH secondary to malignancy is scarce, with few case-reports. Due to pancytopenia, coagulopathy and multiorgan damage, high anesthesia and surgical risk exists, with patient blood management (PBM) as one of the most challenging aspects. Therefore, a multidisciplinary evaluation and optimization, as well selection of optimal surgical timing is fundamental in order to improve patient outcomes.

References:

- 1. Daver N, et al. A consensus review on malignancy-associated hemophagocytic lymphohisticcytosis in adults. Cancer. 2017 Sep 1;123(17):3229-3240.
- 2. Henter JI, et al. Diagnostic guidelines for hemophagocytic lymphohistiocytosis. The FHL Study Group of the Histiocyte Society. Semin Oncol. 1991;18:29–33.

Learning points: Splenectomy in refractory HLH secondary to malignancy is rarely presented to the anesthesiologist. Perioperative management is difficult making multidisciplinary evaluation, PBM and optimal timing for surgery fundamental.

Predicthor: Al-powered predictive risk model for 30-day mortality and 30-day complications in patients undergoing thoracic surgery for lung cancer

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Background and Goal of Study: The significance of predicting postoperative complications in thoracic surgery lies in the impact on patient outcomes and the efficient allocation of healthcare resources. The longstanding use of the Thoracoscore for over 15 years in hospital settings emphasizes the opportune moment for an update, leveraging new artificial intelligence methodologies to enhance predictive precision and relevance. The objective is to assess the predictive performance of Predicthor, an artificial intelligence model, for 30-day mortality and complications following major pulmonary resections.

Materials and Methods: The EPITHOR French population-based database linked to the National Institute of Statistics and Economic Studies database has been queried from January 1, 2016, through December 31, 2022 on six selected hospital centers (Rouen, Dijon and Toulouse CHUs, Strasbourg CHRU, Centre Hospitalier Général de Bayonne and AP-HM) with curated data collection. 6,508 patients who have undergone primary lung cancer surgery via lobectomy or bilobectomy, aged over 18 years, and with an ASA score under 4, were selected. In a retrospective analysis using a three-dataset scheme (training cohort, internal and external validation), we assessed the predictive performance of Predicthor for 30-day complications and mortality following major pulmonary resections.

Results and Discussion: Postoperative complications occurred in 39% of patients, with 31.5% experiencing complications of Clavien-Dindo grade III or higher. Overall mortality was 1.3%. Predicthor excelled in predicting 30-day mortality with an AUC of 0.81(95% CI:0.68-0.93, P=2.06E-05), surpassing the Thoracoscore at 0.73(95% CI:0.62-0.84, P=1.5E-03). Predicthor identified nine key variables, including age, comorbidity scores, tumor characteristics, FEV1 and dyspnea. They were utilized for predicting Comprehensive Complication Index (Pearson-r:0.24, 95% CI:0.18-0.29, P=1E-18) and complications with Clavien-Dindo≥III (AUC:0.64, 95% CI:0.60-0.69, P=4E-09).

Conclusion(s): Predicthor's predictive performance for 30-day mortality and complications highlighted its potential as a valuable tool in clinical decision-making. The study's methodology and comprehensive dataset contribute to its relevance in using machine learning on large available databases for shaping thoracic surgery practices and patient management.

10AP02-2

Meta-analysis of mortality in patients with chronic coronary artery disease: Surgical or percutaneous interventions versus optimized medical therapy – Implications for perioperative management. From PEARL investigators: Perioperative Evidence-based Approach Research Laboratory

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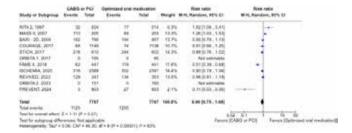
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Background and Goal of Study:Chronic coronary artery disease (CAD) complicates perioperative decision-making, delaying critical surgeries like oncological procedures. This study evaluates mortality outcomes in CAD patients treated with coronary artery bypass grafting (CABG), percutaneous coronary intervention (PCI), or optimized medical therapy (OMT).

Materials and Methods: A meta-analysis of randomized controlled trials (RCTs) was conducted using studies retrieved from Cochrane, Embase, and Medline databases. Inclusion criteria: adult patients (≥18 years) with chronic CAD, comparing CABG/PCI versus OMT groups, with mortality as the primary outcome within study-defined follow-up periods. Studies published from 1990 to May 2024 were included. Data were analyzed using RevMan 5.0 software, applying a random-effects model and relative risk calculation to account for anticipated heterogeneity among the included studies.

Results and Discussion: A search found 7,278 articles (PubMed 1,673, Cochrane 659, Embase 4,946); after removing duplicates and non-eligible studies, 11 were included in the meta-analysis. No significant differences in mortality were observed between the intervention groups (CABG/PCI) and the control group (OMT). High heterogeneity (elevated I² values) was noted, indicating variability across studies and necessitating cautious interpretation.

The observed equivalence in mortality outcomes suggests that in CAD patients, invasive interventions may be reconsidered in perioperative contexts. This approach could reduce delays in surgical management and improve outcomes for patients with severe comorbid conditions, such as cancer. However, these findings are hypothesis-generating due to limited robust data on direct perioperative impacts.



Conclusion(s):The meta-analysis demonstrates no significant difference in mortality between CABG/PCI and OMT strategies in stable CAD patients. These results support the possibility of maintaining OMT during the perioperative period, avoiding invasive procedures that could delay urgent surgeries. Further studies are needed to validate these findings and assess their influence on perioperative outcomes.

The effect of combining music therapy and preoperative educational videos on preoperative anxiety in gynecological patients

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Background and Goal of Study: This study aims to evaluate the impact of combining preoperative music therapy and educational videos within the framework of Enhanced Recovery After Surgery (ERAS) strategies on preoperative anxiety in gynecological patients.

Additionally, the study assesses the intervention's effects on postoperative pain, fatigue, and overall recovery quality.

Materials and Methods: A single-center, prospective, randomized controlled trial was conducted on 80 patients who underwent gynecological laparoscopic surgery at Sichuan Provincial People's Hospital from July 2022 to September 2023. Patients were randomly assigned to the control group (receiving standard ERAS care) or the experimental group (receiving a combination of music therapy and preoperative educational videos).

Anxiety levels were measured using the State-Trait Anxiety Inventory (STAI) at four time points: upon admission (T0), before anesthesia induction (T1), 24 hours post-surgery (T2), and before discharge (T3).

Postoperative pain and fatigue were assessed using the Numeric Rating Scale (NRS), and postoperative nausea and vomiting (PONV) along with catheter-related bladder discomfort (CRBD) were monitored.

Results and Discussion:Baseline characteristics such as age, BMI, education level, and surgery duration showed no statistically significant differences between the two groups (P > 0.05). Compared to the control group, the experimental group exhibited significantly lower STAI scores at T1 and T2 (P < 0.05).

Furthermore, the experimental group reported reduced resting pain, movement pain, and fatigue scores at T2 (P < 0.05), although these differences were not significant at T3. The experimental group also demonstrated significantly higher recovery quality and hospital satisfaction (P < 0.05). No significant differences were observed between the two groups regarding PONV, CRBD, or the time to first ambulation or bowel movement.

Conclusion(s):The combination of preoperative music therapy and educational videos can significantly reduce anxiety, pain, and fatigue in patients undergoing gynecological laparoscopic surgery, thereby improving recovery quality and patient satisfaction.

10AP02-4

Use of perioperative hypnosis by anesthesiologists for surgical and medical procedures: A systematic review with meta-analyses

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Background and Goal of Study: Hypnosis is used in different settings during the perioperative period. Its impact on hypnotic requirements, pain, anxiety, or adverse effects remains unclear. This systematic review with meta-analyses addresses this question.

Materials and Methods: We searched PubMed, Cochrane Library, and Embase for studies (any design) where hypnosis was used perioperatively, alone or with any type of anaesthesia, in children and adults. Two authors selected the studies and extracted the data independently. Risk of bias was assessed for randomized controlled trials (RCT). Random effects meta-analyses were performed using RevManAPP if more than five studies or 100 patients including a comparator group reported on a similar outcome.

Results are reported as weighted mean differences (WMD), standardized mean differences (SMD) when an outcome was reported using different scales, or relative risk (RR) with 95% confidence interval (CI).

The primary outcome was the intraoperative use of hypnotic and opioids. Secondary outcomes included all reported outcomes related to pain, anxiety or adverse events. (PROSPERO: CRD42024538362).

Results and Discussion: 117 articles (7882 patients) were included: 56 RCT, 24 non-randomized studies including a comparator group (NRCS), 17 cohort studies without comparator or case series, and 10 case reports. Studies originating from 18 countries were published from 1974 to 2024.

Hypnosis reduced propofol (number of studies (n) = 6; WMD **-43.5 mg**, 95% CI [-73.3, -13.7]), intraoperative opioids (n=9; SMD -0.86, 95% CI: [-1.68, -0.04]), the number of patients needing class I-II (n=7; RR 0.51, 95%CI [0.32, 0.82] and class III analgesics (n=6; RR 0.66, 95%CI [0.54, 0.79]). Postoperative anxiety (n=13; SMD: -0.68, 95%CI [-0.96, -0.40]) remained unchanged.

Hypnosis had no impact on pain scores, procedure time, duration of ICU or hospital stays, but shortened PACU stay (n=7; WMD -28 minutes 95% CI [-48, -7.9]) and decreased the risk of postoperative nausea and vomiting (n=8; RR 0.48, 95%CI [0.31, 0.74]). The level of evidence for all outcomes ranged from very low to moderate.

Ten uncontrolled studies suggested that most procedures were successfully completed with hypnosis (median 92%), and 8 that patients would repeat the experience (median 95.5%).

Conclusion: Hypnosis may reduce analgosedation and improve postoperative outcomes, but the level of evidence is low.

Postoperative abnormal vital signs in patients recovering from elective non-cardiac surgery on the general ward: a prospective observational study

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Background and Goal of Study: Mortality in the first month after non-cardiac surgery remains high, with the majority of patients dying on general wards during their hospital stay. Abnormal vital signs often precede severe complications, but vital sign alterations often remain undetected by current intermittent manual vital sign monitoring. Due to the lack of continuous vital sign monitoring in patients recovering from surgery on general wards, the incidence and severity of postoperative vital sign abnormalities in this patient population remain largely unknown.

We thus aimed to investigate the incidence, severity, and duration of postoperative abnormal vital signs in patients recovering from elective non-cardiac surgery on the general ward within the first five postoperative days.

Materials and Methods: We conducted a single-centre prospective observational study in 190 patients after elective non-cardiac surgery. Continuous vital sign monitoring (peripheral oxygen saturation (SpO₂), systolic arterial pressure, heart rate, respiratory rate, and body temperature) was performed using a wearable wrist sensor (Biobeat wrist sensor; Biobeat Technologies, Petah Tikva, Israel) for up to five postoperative days. The primary outcome was the normalized cumulative duration (% of monitoring time) with any abnormal vital sign.

Secondary outcomes included the incidence, severity, and duration of abnormal vital signs. We defined abnormal vital signs as: $SpO_2 \le 91\%$, systolic arterial pressure ≤ 90 mmHg or ≥ 220 mmHg, heart rate ≤ 40 beats per min or ≥ 131 beats per min, respiratory rate ≤ 8 breaths per min or ≥ 25 breaths per min, and body temperature ≤ 35 °C or ≥ 39.1 °C.

Results and Discussion: The median normalized cumulative duration with any abnormal vital sign was 6% (3%, 12%). Abnormal vital signs were common, occurring in 76% of patients for at least 5 consecutive minutes.

Hypoxemia and bradypnea were the most common vital sign abnormalities, affecting 60% and 44% of patients for at least 5 consecutive minutes, respectively. Severe abnormal vital signs lasting ≥30 consecutive minutes were less common (18% of patients).

Conclusions: Abnormal vital signs were common in patients recovering from non-cardiac surgery on general wards – with bradypnea and hypoxemia being the most common. One of five patients experienced prolonged episodes with abnormal vital signs. It needs to be determined whether continuous vital sign monitoring on general wards improves patient outcomes.

10AP02-6

Perioperative acute myocardial injury in women: is there any difference with men?

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Background and Goal of Study: Male sex has been demonstrated to be an independent predictor for acute perioperative myocardial injury (PMI). We aimed to investigate differences between men and women who present PMI.

Materials and Methods: Post-hoc analysis of the MINSMAR data base. Prospective, single-centre cohort study enrolling patients (≥45 years) at risk for major adverse cardiovascular and cerebrovascular events (MACCE) scheduled for intermediate-to-high risk noncardiac surgery. Baseline high-sensitivity troponin T (hsTnT) and N-terminal fragment of pro-B-type natriuretic peptide (NT-proBNP), as well as hsTnT on the first 3 postoperative days were obtained.

Main outcome was the occurrence of acute PMI on the day of surgery or within the first three postoperative days. PMI was defined by at least one hsTnT value ≥30ng/L provided there was a rise and/or fall of at least 20% of the baseline hsTnT concentration. We also registered all-cause mortality and MACCE at 30 days and one year follow-up.

Results and Discussion: Of 732 patients analysed, 243 (33%) were women and 489 (67%) were men. PMI occurred in 161 patients (22%), of whom 43 (27%) were women. We found differences in the incidence of PMI between both sexes (18% in women vs 24% in men, *P*=0,048). Women who suffered PMI were older than those who did not [(78 yr.; 95% CI (74-83) vs 72 yr. (63-78)] and had more comorbidities: more prevalence of anaemia, hypertension, diabetes, heart failure, atrial fibrillation, worse kidney function and poorer functional capacity.

Compared to men, women with PMI were more obese, more anaemic and had higher cholesterol levels, but men had higher prevalence of known coronary and peripheral arterial disease and tobacco consumption.

In patients with PMI, we did not find sex differences in the prevalence of elevated preoperative hsTnT (\geq 14ng/L), 88% in women vs. 82% in men (P=0,460); however, elevated preoperative NT-proBNP (\geq 300pg/mL) was more prevalent in women (81% vs. 54%, P=0,002). In patients with PMI, we did not find differences between women and men in 30 days MACCE (18,6% vs. 25,4%; P=0,410) and mortality (4,7% vs. 3,4%; P=0,658) and 1 year mortality (18,6% vs. 25,4%; P=0,410), but MACCE at 1 year was higher in men (25,6% vs 50,8%; P=0,002).

Conclusion(s): The most notable differences between men and women with PMI are a higher prevalence of preoperative elevated NT-proBNP (≥300pg/mL) in women and a higher MACCE incidence at one year in men.

Perioperative Care

10AP02-7

Assessment of post-operative sore throat at the post-anesthetic care unit

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Background and Goal of Study: Postoperative Sore Throat (POST) is a frequent complaint following surgeries under general anesthesia with airway management. Its incidence varies between 33–61%, impacting patients' satisfaction. Factors suggested as potentiators of POST include ventilation device, number of intubation attempts, use of naso/orogastric tubes, and airway adjuncts like bougies or stylets. Pharmacological interventions have also been proposed as protective.

This study aims to evaluate the incidence of POST in the Post-Anesthetic Care Unit (PACU) of the Santo António Local Health Unit (ULSSA) and verify whether it aligns with reported rates. It also assesses POST intensity using the Visual Analog Scale (VAS, 0–10) and seeks to identify variables associated with higher or lower POST incidence.

Materials and Methods: Following institutional approval of an internal audit, we retrospectively analyzed the medical records of patients undergoing surgeries performed under general anesthesia with airway management between August and September 2024 in ULSSA. Those younger than 18 years, undergoing head, neck, or throat surgeries, or with a respiratory infection in the past month were excluded.

Demographic data, airway management techniques, pharmacological measures (dexamethasone, ketamine, lidocaine, NSAIDs), and POST VAS scores were analyzed using SPSS Statistics®.

Results and Discussion: Of 106 patients, 66% were male, with a mean age of 62. Most were ASA III (41.5%) and underwent general surgery procedures (35.8%). POST was identified in 21.7% of cases, with moderate pain reported in 5%, predominantly linked to endotracheal tube use. Airway approach with direct laryngoscopy or videolaryngoscopy did not lead to significant differences in POST, nor did the use of an orotracheal tube vs supraglottic devices. Pharmacological measures showed no protective effect against POST, nor was an association found between POST and the use of bougies or stylets. However, difficult laryngoscopies and multiple intubation attempts were associated with increased POST risk. The limited number of cases with moderate pain (n=5) may have restricted conclusions.

Conclusion(s): It is up to anesthesiologists to act according to the best evidence to prevent POST and treat it appropriately. Difficult laryngoscopies and multiple airway management attempts were related to a higher risk of POST, underscoring the importance of optimizing conditions during the first airway attempt.

10AP02-8

Every second counts: The dangers of delayed dantrolene administration in malignant hyperthermia

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Background: Malignant hyperthermia (MH) represents a critical perioperative emergency with potentially fatal consequences. Due to limited reported cases in our region, professional awareness and early diagnostic precision remain challenging.

This case presentation explores MH diagnostic complexities and strategic management, adhering to the European Malignant Hyperthermia Group's 2024 guidelines (1).

Case Report: We present a case of a 21-year-old male without significant medical history who underwent surgical excision of anal condylomas in a private medical center. Administered medications during general anesthesia included midazolam, ketamine, propofol, fentanyl, rocuronium, and sevoflurane.

Postoperatively, the patient exhibited altered consciousness with pronounced sympathetic and muscular hyperactivity. Additional clinical findings included renal dysfunction with rhabdomyolysis, fever, hyperckemia, and increased lactate levels.

Given the critical nature of his condition, the patient was transferred to a tertiary-level medical center with a specialized MH Unit after 24 hours. Dantrolene was promptly administered, resulting in an adequate clinical response.

Following consciousness improvement, the patient presented with neurological sequelae, including immediate memory deficit and proximal lower extremity muscle weakness.

Genetic investigation through sequencing identified the patient as a heterozygous carrier of a variant of unknown significance (VOUS) in the CACNA1S gene, likely pathogenic of malignant hyperthermia.

Ongoing genetic screening is being performed in family members and in vitro contracture test (IVCT) is scheduled.

Discussion: By examining the diagnostic process, we aim to enhance clinical awareness among medical professionals confronting this rare but life-threatening condition. Timely Dantrolene administration is critical, as it not only reduces mortality but also mitigates potential long-term morbidity associated with delayed treatment.

Additionally, current guidelines suggest that DNA screening serves as a viable alternative to traditional diagnostic methods for primary evaluation (2).

References:

- 1. British journal of anaesthesia, 105(4), 417-420.
- 2. British journal of anaesthesia, 115(4), 531-539.

Learning points:

Malignant hyperthermia requires rapid recognition and immediate intervention with dantrolene.

Genetic screening provides crucial insights into familial risk and diagnostic evaluation.

10AP02-9

Adherence to recommendations and real situation of preoperative fasting in elective surgery patients of a Lithuanian tertiary center

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Background and Goal of Study: Current fasting guidelines state that no clear liquids should be consumed <2h, solid food <6h before surgery [1,2]. However, following guidelines is a problem.

The aim of the study was to evaluate the situation in Lithuanian University of Health Sciences Hospital Kaunas Clinics (KC) in terms of awareness, real-time intake and possible adverse symptoms of dehydration.

Materials and Methods: The anonymous survey study received ethical approval (No 2023-BEC2-263) and was performed at KC in 11.2023 – 10.2024. Adult consecutive Lithuanian speaking, mentally healthy and admitted for elective surgery in 24h patients were asked to fill an original questionnaire.

Anaesthesiologists were asked to report intraoperative complications possibly related to fasting. Statistical analysis was performed with SPSS 29.0.0.0. Data is presented as mean±SD, number or % of cases.

Results and Discussion: The study included 87 patients, 36 males and 51 females. Mean time of last intake before surgery was 10.82±5.72 h for fluid and 16.16±4.39 h for solid food. According to patients, fluids must not be taken preoperatively: <2h in 16(18.4%), <6h in 51(58.6%), <24h in 16(18.4%) and indefinitely in 4(4.6%) cases, respectively.

Patients stated they knew the definition of clear fluids in 65(74.7%) cases but only 42(48.3%) of them marked the correct list of clear fluids. 79(90.8%) patients were informed about preoperative fluid intake: 52 by the surgeon, 35 - a resident doctor or another specialist, 29 - family doctor or nurse, 23 - an anaesthesiologist, 12 - relied on previous knowledge or social media.

Complaints related to prolonged fasting were xerostomia (n=45), thirst (n=43), heart palpitations (n=19), headache (n=11), fatigue (n=7), dizziness (n=5), muscle cramps (n=4), nausea (n=2).

Anaesthesiologists reported the following intraoperative adverse effects related to prolonged fasting: 7 cases of arterial hypotension, 3 cases requiring iv fluids and vasopressors and 1 case of bradycardia requiring atropine.

Conclusions: Patient awareness of preoperative fasting is low: 18.4% of respondents define recommended intervals correctly. Mean duration of last oral intake exceeds the recommended interval by 5 times for clear fluids and 2.5 times - solid food. This leads to subjective and objective haemodynamic adverse effects of hypovolaemia.

References:

- 1. Smith I et al. Eur J Anaesthesiol. 2011;28(8):556-69.
- 2. Frykholm P et al. Eur J Anaesthesiol. 2022;39(1):4-25.

10AP02-10

Anesthesia for a patient with Steinert myotonic dystrophy and Neurofibromatosis type 1: a case report

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Background: Neurofibromatosis type 1 (NF1) is an autosomal dominant disease with complete penetrance which affects 1 in every 3,500 individuals¹. Myotonic dystrophy type 1 (Steinert's disease) is an autosomal dominant disease with variable expression, affecting 1 in every 20,000 individuals².

This study describes the anesthetic management of a patient with both conditions.

Case report: A 28-year-old male (VJJS), diagnosed with NF 1 and Steinert's disease, was admitted for excision of a neurofibroma in the brachial plexus. Electroneuromyography showed sensory and motor impairment of the left ulnar nerve, as well as motor impairment in all nerves studied. He presented with cutaneous neurofibromas in the trunk, macroglossia, macrocephaly and elongated face. He denied cardiac, endocrine, or gastrointestinal issues. Induction was made with fentanyl, lidocaine, propofol and rocuronium and orotracheal intubation was performed with videolaryngoscopy. Maintenance was attained with propofol, remifentanil and dexmedetomidine, followed by methadone 10mg IV. The surgical team infiltrated the surgical wound with 10 mL of 0.5% levobupiyacaine.

At the end of surgery, extubation was performed without reversal agents as TOF ration of 92. He was transferred to the post-anesthesia care unit and was discharged after 1 hour without complaints.

Discussion: The patient's airway management is potentially difficult due to intraluminal neurofibromas, difficult face mask ventilation and the increased sensitivity to neuromuscular blocking agents¹. Patients with Steinert's disease are more sensitive to all neurmuscular blockers³.

Analgesia is also challenging, especially in NF1, as neurofibromas often cause chronic neuropathic pain¹. Additionally, uncontrolled pain can induce mytonia in patients with Steinert's disease³.

References:

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Learning points: There is limited evidence regarding the anesthetic management of patients with NF1 or Steinert's myotonic dystrophy.

Measuring quality of recovery-9 in adult patients following lower limb orthopaedic surgery

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Background and Goal of Study: The nine-item quality of recovery (QoR-9) score is a validated patient-centred outcome measure of postoperative recovery. The maximum score is 18, with a score ≥ 17 indicating a good recovery and a score of ≤15 indicating poor recovery[1]. This study aimed to evaluate the quality of recovery in adult patients at weeks one, two and six post lower limb orthopaedic surgery

Materials and Methods: A longitudinal study was conducted from October 2020 to March 2021, including adult patients aged ≤70 years who underwent orthopaedic surgery at or below the knee level. Patients readmitted within six weeks of surgery were excluded. Eligible patients completed telephone interviews at weeks one, two and six postoperatively, during which the QoR-9 questionnaire was administered. Participants were grouped by surgical complexity (minor vs non-minor) and descriptive statistics was used for comparison between groups. Data from 220 patients were analysed; 123 patients were lost to follow-up during the study.

Results and Discussion: Results are shown below:

	Week 1		Week 2		Week 6	
	Mean	95%CI	Mean	95%CI	Mean	95%CI
Overall (n=220)	14.6	[14.2,15.0]	15.8	[15.4,16.2]	16	[15.5,16.5]
Minor Surgery (n=74)	14.9	[14.3,15.6]	15.9	[15.1,16.6]	15.8	[14.8,16.6]
Non- Minor Surgery (n=146)	14.4	[14.0,14.9]	15.8	[15.3,16.2]	16.1	[15.6,16.7]

In the first week, 120 patients (55%) experienced poor quality of recovery, with a mean score [95%CI] of 12.7 [12.3,13.1]. Their recovery improved in weeks two and six, with a mean score of 14.8 [14.2,15.1] and 15.4 [14.6,16.1], respectively.

Whilst a *clinically important* improvement (a score increase ≥ validated threshold of 0.9) was observed in all patients, including in those with poor recovery in the second week, further improvements in the following weeks were not clinically important [2]. Pain was the leading cause of poor recovery, with 54-74% of these patients reporting persistent or severe pain throughout the study.

Conclusion(s): Patients experienced poor recovery in the first week, with significant improvement observed by the second week. Subsequent improvements were not clinically important, suggesting an extended follow-up period is needed to better capture recovery trajectories. Pain is the main contributor to poor recovery, highlighting the importance of prolonged postoperative analgesia in patients undergoing lower limb orthopaedic surgery.

References:

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10AP02-12

Preoperative serum concentrations of Alzheimer's disease(AD)-related biomarkers, amyloid beta $(A\beta)$ and total tau (t-tau), and postoperative delirium (POD) incidence after cardiac surgery

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Background-Goal of Study: AD and related dementias pathology is a significant predisposing risk factor for POD.¹ A β peptides and tau proteins are known to play a central role in AD-related dementia pathogenesis. We aimed to assess associations between A \Box , t-tau and delirium after cardiac surgery. We also tested correlations between these biomarkers and preoperative cognitive status.

Materials-Methods: Serum quantification of A β 40, A β 42 and t-tau, and determination of A β 42/40 ratio were performed preoperatively in 220 adult patients undergoing elective cardiac surgery (B403201837550).

Preoperative cognitive status was evaluated using five neurocognitive tests, from which a cohort-specific *Z*-score was calculated. CAM-ICU, CAM and a chart review were used for POD screening until hospital discharge. Biomarkers concentrations were log-transformed to obtain normally distributed data.

Comparisons between groups were performed using either Mann-Whitney U test or Student t-test, and Chi-square test. Pearson coefficients assessed correlations between biomarkers and preoperative cognitive *Z*-score.

	POD (-) (n=155)	POD(+) (n=65)	P-value
Age, years	67 (59, 74)	74 (64, 79)	<0.001
Preoperative cognitive Z-score	0.21 ± 0.84	-0.52 ± 1.14	<0.001
Surgical time, min	226 ± 57	238 ± 60	0.170
Aβ40, pg/ml	147.5 (94.8, 199.4) (n=154)	160.4 (102.3, 212.4) (n=63)	0.182
Aβ42, pg/ml	8.9 (6.5, 11.3) (n=154)	8.2 (5.8, 11.7)	0.384
Αβ42/40	0.06 ± 0.02	0.06 ± 0.02	0.197
t-tau, pg/ml	0.6 (0.4, 1.0) (n=143)	0.9 (0.5, 1.1) (n=60)	0.033

Table 1.

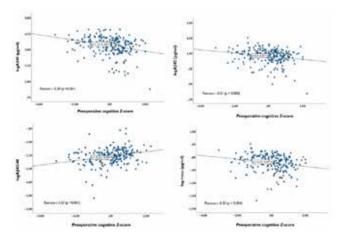


Figure 1.

Results-Discussion: Preoperative data are detailed in Table 1. Among AD-related biomarkers, only t-tau concentrations were significantly higher in patients who developed POD (P=0.033). Statistically significant correlations were found between these biomarkers and preoperative cognitive testing (Fig.1), although these correlations were poor (all Pearson coefficient r <0.29).

Conclusions: Preoperative serum concentrations of AD-related biomarkers were poorly associated with POD and preoperative cognitive scores. These observations suggest that the relationship between AD and POD is complex despite apparent epidemiological similarities.

Reference:

1. Reekes TH et al. BJA 2023;131(2):205-208

10AP03-2

Virtual reality versus pharmacological sedation during regional anesthesia: a prospective, randomized controlled study on patient satisfaction

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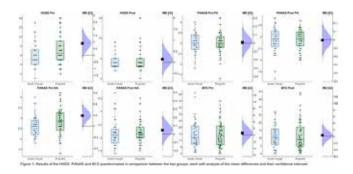
Background: Virtual reality (VR) is becoming a valuable tool in medicine. It can be used for training purposes, diagnostics, or intraoperative support. In the anesthesia setting, it can, e.g., help educate patients and manage their anxiety. Our study evaluated the non-inferiority of audiovisual sedation (AVS) during regional anesthesia compared to pharmacological sedation.

Methods: After obtaining ethical approval, we conducted a controlled, randomized, monocentric study involving 146 patients. Patients who had to undergo regional anesthesia with sedation were randomized into two groups. One group received propofol, the other was exposed to calming audiovisual content using HappyMed video glasses.

We evaluated anxiety, stress, and overall state of mind before and after surgery through questionnaires, i.e., the Hospital Anxiety and Depression Scale (HADS), Positive and Negative Affect Schedule (PANAS NA/PA), and the "Befindlichkeitsskala" (BFS, state of mind scale). Student-t and Fisher exact tests were used to compare demographic and surgical variables and the mean difference with 95% confidence intervals was used as effect size to assess non-inferiority.

Results and Discussion: 125 patients were included in the analysis, 53 in the AVS and 72 in the propofol group. Baseline characteristics (e.g., age, gender, BMI) were not significantly different, but procedures with VR averaged 24.5 minutes shorter than pharmacological sedation. This was because 11 patients either requested sedation or discontinued AVS after a certain time. Regarding patient well-being, AVS was non-inferior to propofol sedation. Patients in the propofol group had (non-significantly) higher HADS (propofol: 7 [5;9]; AVS: 5 [4;7]) and PANAS-NA (propofol: 2.9 [2.4;3.3]; AVS: 2.6 [2.2;2.9]) before the intervention. All other scores were in the same range as presented in the Figure.

Conclusion: The first results of our study indicate that AVS may be a viable and economical alternative to pharmacological sedation for non-emergency regional anesthesia with a shorter duration, enabling optimized, patient-tailored care. Future investigations will also consider heart rate variability as a parameter.



10AP03-4 Low opioid anaesthesia in bariatric patients: a retrospective cohort study

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Background and Goal of Study: The risk of opioid-induced respiratory depression is heightened by obesity-related physiological changes¹. To reduce perioperative opioid requirement our institution introduced low opioid anaesthesia (LOA) in bariatric patients in 2023. The goal of this study was to examine post-operative morphine and oxygen requirements as well as the length of stay (LOS) on the post-anaesthesia care unit (PACU) before and after the introduction of LOA.

Materials and Methods: Retrospective data from 2023 (n=130), after the introduction of LOA, was analysed and compared with data from 2021 (n=123) when opioid balanced anaesthesia (OBA) was practiced. We defined LOA as "an effort to reach a TCI dose of 2 ng/ml remifentanil intraoperatively without other opioids". Standardised doses of non-opioid analgesia were administered to the LOA group; 600mg magnesium, 100mg lidocaine, 150μg clonidine and 10mg S-ketamine. Propofol was used as standard hypnotic in the LOA group, while desflurane was standard in the OBA group. Paracetamol, ketorolac and dexamethasone were the same in both groups. Remifentanil doses were reduced according to patient response. All drugs were administered intravenously perioperatively. Groupwise comparisons were carried out with Kruskal-Wallis test due to right-skewedness of the endpoint distributions.

Results and Discussion: The LOA group had significantly reduced opioid requirement postoperatively compared with the OBA group, the medians and interquartile intervals for the morphine equivalent dose were 2.0 (0.0, 4.0) mg vs 7.5 (0.0, 15.0) mg (p<0,001). In the LOA group, 10,8% required oxygen postoperatively vs 49,5% in the OBA group. PACU LOS was 125.5 (102.0, 156.0) min in the LOA group vs 147.0 (128.0, 172.0) min in the OBA group (p<0,001). These results indicate benefits of multimodal and LOA compared to OBA.

Conclusion: Implementation of standardised LOA significantly reduced postoperative morphine requirements, the need for supplemental oxygen administration, as well as reducing the PACU LOS in bariatric patients. This method effectively introduced LOA without requiring additional resources, yielding clear benefits for patients.

Reference:

1. Efficacy of nonopioid analgesics and adjuvants in multimodal analgesia for reducing postoperative opioid consumption and complications in obesity: a systematic review and network meta-analysis. Carron, Michele et al. British Journal of Anaesthesia, Volume 133, Issue 6, 1234 - 1249

10AP03-5

Comparison of the effects of isoflurane and desflurane on the optic nerve sheath diameter in elderly patients undergoing robot-assisted laparoscopic urological surgeries in steep trendelenburg position: a randomized controlled trial

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Background and Goal of Study: Optic nerve sheath diameter (ONSD) serves as a reliable surrogate marker for intracranial pressure (ICP) during robot-assisted laparoscopic radical prostatectomies (RARP). The steep Trendelenburg position and carbon dioxide pneumoperitoneum used in RARP elevate ICP, with patients over 60 years experiencing worsened cerebral autoregulation and compliance. Among factors influencing ONSD, the choice of anesthetic agents holds particular significance.

While total intravenous anesthesia with propofol has demonstrated better control of ONSD compared to inhalational agents, the latter's dose-dependent vasodilatory effects on cerebral vessels remain understudied.

This trial aimed to compare the effects of isoflurane and desflurane on ONSD in elderly patients undergoing RARP.

Secondary goals included the incidence and duration of neurological complications, postoperative cognitive impairment, delayed recovery, and hospital stay period.

Materials and Methods: A prospective randomized controlled study was conducted on 54 elderly patients aged 60 years and above, undergoing RARP.

These patients were randomized to receive isoflurane or desflurane for maintenance of anesthesia. ONSD measurements were obtained at baseline, during pneumoperitoneum, and postoperatively using ultrasound. Hemodynamic parameters and recovery profiles were also recorded.

Data analyses utilized Pierson Chi-square test, independent sample T-test and Mann Whitney Test.

Results: A total of 54 patients were analyzed. While mean ONSD values at T2, T3, and T4 raised from baseline in both groups, the values remained within normal limits without significant intergroup differences.

At T5, ONSD values returned to baseline in all patients. Neither group exhibited postoperative complications, cognitive impairment, or delayed recovery.

These findings indicate that both agents are viable anesthetic options for elderly patients undergoing RALP, as their effects on ICP are minimal and transient.

Conclusion: Isoflurane and desflurane exhibit comparable and safe profiles in terms of ICP elevation during RARP. Both agents are effective for maintenance anesthesia in elderly patients requiring steep Trendelenburg positioning for procedures.

Reference: Verdonck P, Kalmar AF, Suy K, Geeraerts T, Vercauteren M, Mottrie A, De Wolf AM, Hendrickx JF. Optic nerve sheath diameter remains constant during robot assisted laparoscopic radical prostatectomy. PLoS One. 2014 Nov 4;9(11):e111916.

10AP03-6

Feasibility and efficacy of multimodal prehabilitation in patients awaiting pancreaticoduodenectomy: results from a prospective cohort study

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Background and Goal of Study: Pancreaticoduodenectomy (PD) is a highly aggressive surgical procedure frequently associated with a high incidence of postoperative complications (30-50%). Reduced cardiorespiratory fitness has been associated with an increased risk of complications in various surgical procedures, including PD.

The aim of this study was to evaluate the feasibility and efficacy of multimodal prehabilitation in improving cardiorespiratory fitness in patients awaiting PD for pancreatic cancer.

Materials and Methods: Prospective cohort study. Patients awaiting PD for pancreatic cancer were assessed for surgical risk using a cardiopulmonary exercise test (CPET). Patients with an anaerobic threshold (VO₂AT) <11 ml/kg/min were classified as high risk and referred to the Prehabilitation Unit. Multimodal prehabilitation, including nutritional optimization and supplementation, stress reduction, behavioural change, and supervised exercise training three times per week, was provided to optimize functional capacity. Patients were evaluated by a multidisciplinary team at baseline and prior to surgery.

The main outcomes were:

 i. Difference between pre- and post-prehab in maximal (VO₂peak) and submaximal (VO₂AT) exercise capacity;

ii. Feasibility and adherence to the intervention.

Results and Discussion: Between January 2021 and July 2023, 77 patients were screened for eligibility, and 67 underwent a baseline CPET (87%). Thirty-nine patients (58%) were classified as high risk based on a VO₂AT < 11ml/kg/min. Multimodal prehabilitation was feasible (defined as a duration of ≥3 weeks) in 25 patients (64%). Patients completed a median of 10 sessions (Q1–Q3: 7.5–12.5), with adherence reaching 83% (Q1–Q3: 67–93). Only 22 patients (56%) underwent a CPET before surgery, primarily due to logistical reasons (n=9), disease progression (n=3), or changes in surgical scheduling (n=5).

A significant increase was observed in VO_2 peak (ml/min/kg) (Z = -3.180, p < .001), VO_2 AT (ml/min/kg) (Z = -3.516, p < .001), as well as in maximum and submaximal load (Z = -4.11, p < .001 and Z = -3.623, p = .003, respectively). After undergoing multimodal prehabilitation, half of the patients (54.5%) achieved a VO_2 AT of \ge 11 ml/kg/min.

Conclusion(s): Multimodal prehabilitation appears feasible in patients awaiting PD and may lead to an increase in preoperative cardiorespiratory reserve, potentially reducing surgical risk.

10AP03-7

Adaption and validation of the Greek version of Addenbrooke's Cognitive Examination III scale as a screening tool for perioperative cognitive impairment detection

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Background and Goal of Study: Postoperative cognitive dysfunction (POCD) denotes a subtle to extensive decline in cognitive performance persisting after the acute phase (4–6 weeks), surpassing the time needed for recovery from the acute impact of surgery.

We aim to assess the validity and reliability of a culturally adapted Greek version of the Addenbrooke's Cognitive Examination III (ACE-III) scale as a screening tool for perioperative neurocognitive status determination in elderly surgical patients.

Materials and Methods: A cross-cultural adaptation and validation of instruments throughout the cross-sectional study was conducted. The study sample consisted of 128 individuals over 55 years old scheduled for surgical intervention.

All participants were screened twice; at the preadmission clinic and the day before surgery using the already established MoCA scale and the culturally adapted Greek version of the ACE-III scale. Subjects with a MoCA score of < 26 constituted the cognitively impaired group.

Results and Discussion: In terms of validity, ACE-III's performance in detecting cognitive impairment was excellent (AUC =0.942; 95%CI 0.899-0.971; cutoff ≤ 86). The discriminant validity of the ACE-III components highlighted memory (AUC =0.899) and language (AUC =0.881) as the most powerful subdomains for screening cognitive dysfunction in surgical patients, followed by visuospatial function (AUC =0.755), verbal fluency (AUC =0.724) and attention (AUC =0.685). Convergent validity between ACE-III and MoCA scales was excellent (r= 0.876; 95%CI 0.839-0.905). Known group validity was confirmed since advanced age and lower educational attainment adversely impacted ACE-III's total score (p<0.001).

Additionally, face validity was suggested by specialists (mean 8.7 out of 10, SD 1.1). In terms of reliability, ACE-III demonstrated good internal consistency (Cronbach's alpha 0.786) and high interrater (ICC=0.936 [95%CI 0.921-0.941]) and test-retest reliability (ICC=0.972 (95%CI 0.958-0.981). Age (p<0.05) and education level (p<0.001) but not gender and dominant hand were identified as major contributors to MoCA and ACE-III scores.

Conclusion(s): It occurs that the Greek version of ACE-III is a valid, and reliable screening tool that could be routinely employed perioperatively as a valid alternative to the MoCA test to distinguish the mild cognitively impaired from healthy elderly candidates for surgical interventions.

10AP03-8

Orthopaedics trauma list pre-operative fasting time at Mater Dei Hospital in Malta

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Background and Goal of Study: Preoperative fasting helps prevent pulmonary aspiration but prolonged fasting leads to dehydration, hypoglycaemia, acute kidney injury and insulin resistance. Local and international guidelines recommend fasting times of 6 hours for solid food, milk, tea, coffee, juices and fizzy drinks and 2 hours for clear fluids.

This audit assesses preoperative fasting practices in trauma-list patients within Mater Dei Hospital.

Materials and Methods: Data protection and organisational approval was obtained.

Two hundred patients undergoing orthopaedic trauma surgery between April and July 2024 were included with selection being done via convenience sampling.

Data was collected from medical records and included patients' demographics, surgery underwent, fasting duration, intravenous (IV) fluid administration, and rescheduled cases' details.

Results and Discussion: 196 (98%) patients were aged between 60 and 89 years and were graded as American Society of Anaesthesiologists (ASA) grade 2. Dynamic Hip Screw (DHS) was the most common surgery performed.

Fasting times ranged from 6 to 22.5 hours with a median fasting time of 13 hours 22 minutes and a mean of 12hours 57minutes. 136 (68 %) patients began fasting at midnight, despite 69 (50.7 %) of these having afternoon procedures.

85 (42.5%) patients received no preoperative IV fluids, with 38 amongst these having afternoon surgeries.

73 (36.5 %) surgeries were postponed by 1 to 4 days, primarily due to insufficient theatre time. Decision of rescheduling was most commonly taken in the afternoon.

Conclusion(s): Since observed fasting practices exceed guideline recommendations, multidisiplinary interventions are needed to optimise practice. Information sessions should be held for nurses, junior doctors, surgeons and anesthetists.

Detailed, real-time trauma list planning may help decrease number of postponed surgeries and the associated futile fasting whilst allowing patients on afternoon trauma lists to have an early breakfast

This should be followed up by future re-auditing to ensure ongoing optimization of fasting practices.

10AP03-9 Breaking Barriers in thyroid surgery: the role of ERAS protocols in modern surgical practice

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Background and Goal of Study: Enhanced Recovery After Surgery (ERAS) protocols aim to optimize perioperative management, reducing both complications and hospital stay. Although widely used in colorectal surgery, its application in thyroid surgery is limited. Our ERAS thyroid protocol, jointly developed by the Endocrine Surgery and Anaesthesia units at University Hospital Integrated Trust of Verona, was introduced for thyroid surgeries in May 2024.

This study evaluates protocol's effectiveness, particularly for perioperative pain management.

Materials and Methods: Consecutive patients undergoing thyroid surgery for benign or malignant conditions before and after ERAS implementation. Propensity score matching (PSM) minimized bias, matching patients per group by age, gender, BMI, procedure type, and preoperative vitamin D use. Within the ERAS group, the effect of bilateral superficial cervical plexus block (BSCPB) was also examined.

Results and Discussion: 128 patients were analyzed (64 per group). Following PSM, matched patient pairs showed a significant reduction in hospital stay (p < 0.001), postoperative nausea/vomiting (3.1% vs. 12.5%, p = 0.04), and pain scores (NRS > 5) within 12 hours post-surgery (9.4% vs. 26.6%, p = 0.01) among ERAS patients. ERAS patients also had higher calcium levels 6 and 24 hours post-op, reducing calcium gluconate therapy needs (0% vs. 12.5%, p = 0.003).

Among ERAS patients, BSCPB recipients had higher pain scores on the morning of postoperative day 2 (p = 0.009) and required more rescue analgesics (p = 0.025), with a greater incidence of headaches (p = 0.027).

Conclusion(s): ERAS significantly improved pain control, reduced rescue analgesia, and shortened recovery time, with fewer hospital days. It also lowered nausea and vomiting rates, optimized calcium management, and decreased calcium infusion needs. These benefits, driven by preemptive analgesia, early mobilization, and refeeding, underscore ERAS as an advance in thyroid surgery management, enhancing clinical outcomes and quality of life.

Contrary to existing data, BSCPB offered no added benefit over wound infiltration alone, with greater headache incidence linked to BSCPB, possibly from neurological and muscular factors. Ultrasound guidance and meticulous technique may help reduce these complications. Further studies could clarify ERAS pain management strategies for headache-prone patients.

10AP03-10

Assessment of a novel smartphone-based digital health tool for post-operative care in Zambia

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Background and Goal of Study: More than 4 million people annually die within 30 days after surgery, with a disproportionate burden in low- and middle-income countries (LMICs). Reducing the rate of failure to rescue (FTR), defined as the death of a patient after potentially treatable complications, could reduce in-hospital postoperative mortality, in these settings.

Many frontline healthcare personnel lack optimal support to be able to provide this timely, essential post-operative care to potentially prevent failure to rescue events. To facilitate such support, we developed a smartphone-based tool to guide consistent, high quality post-operative care.

This research project evaluated Zambian healthcare professionals' initial feedback on this novel tool's usability.

Materials and Methods: In 2023, a post-operative care task force was established including representatives from the Zambian Ministry of Health. the Zambian Institute of Digital Health, and Zambian healthcare providers to reach consensus regarding gaps in post-operative care. Based on their input, a smartphone-based, high-fidelity prototype application was developed using glideapps.com.

Volunteer physician and non-physician providers conducted hands-on interaction sessions with the digital tool at 3 medical center sites across the Lusaka province in November 2024. A validated System Usability Scale queried user perception of utility analyzed using descriptive statistics.

Results and Discussion: Twenty nurses, 2 physicians, 7 non-physician anesthesia providers, and 1 medical officer participated, with 22 of the 30 aged 20-40 years. Most (26/30) reported that "they would like to use this system frequently" and 28/30 reported they "felt very confident using the system."

A majority (29/30) strongly disagreed that the system was "unnecessarily complex" and 24/30 reported that the "various functions were well integrated."

Yet, almost half of the participants (14/30) picked responses of strongly agree to neutral for "needed to learn a lot of things before I could get going with this system."

Conclusion(s): Initial feedback on ease of use, navigation, and perceived relevance was favorable of this novel post-operative care digital health tool. Based on these encouraging results we will pursue further iterative refinements in digital tool design and conduct efficacy testing.

Acknowledgements: Global Academic Anesthesia Consortium (GAAC)

10AP03-11

Management of emergence delirium in 17-year-old patient: case report

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Background: Emergence delirium is an acute state characterized by agitation, disinhibition, restlessness and mental confusion. It may manifest as agitation (hyperactive subtype) or as somnolence with altered mental status (hypoactive subtype), occurring in the postoperative period after initial emergence of anaesthesia.¹

There are multiple causes for this entity. Risk factors include preoperative anxiety, age < 6 years, use of volatile anaesthetics, use of perioperative corticosteroids, postoperative pain, among others. Nevertheless, this entity can occur in all age groups and all types of anaesthesia.

Case Report: We report the case of a 17-year-old man scheduled for colonoscopy under sedation with propofol. After the procedure, he was transferred to the post-anaesthetic care unit, where he became disoriented and started exhibiting aggressive and combative behaviour.

He was re-sedated with propofol and midazolam. Upon reawakening, aggressive behaviour persisted and disorganized speech and hallucinations followed. Haloperidol 5 mg IV was administrated, resulting in a gradual decrease in agitation and aggressiveness. When waking up again, the patient exhibited total amnesia regarding the event but was fully oriented.²

After a full recovery, he was discharged home with a follow-up appointment for paediatric psychiatry to undergo further evaluation and and to rule out organic causes. This evaluation confirmed the absence of an organic aetiology.

Discussion: Emergence delirium is an acute confusional state characterized by an alteration of consciousness. This is more commonly seen in pre-school children who are anaesthetized using inhalation anaesthetics, rarely needing pharmacological intervention.

However, it also occurs in older children and young adults given intravenous anaesthetics. Clinicians should be familiarized with the clinical features of emergence delirium and therapeutic options available.

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Learning Points: Emergence delirium can occur in all patients, including those without risk factors. Swift identification of emergence delirium and appropriate management are paramount to reduce its duration and severity and significantly improve outcomes.

10AP04-1

Bridging the gap in perioperative pain caresetting up the first transitional pain clinic in Switzerland. Tips, tricks, hurdles

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Background: Prolonged postoperative pain (PPP) is frequent after surgery. It has major socioeconomic implications, putting patients at risk of opioid dependence and transition to chronic pain. Orthopedic operations have the highest rate of PPP. Access to specialized care allows to reduce opioid use and limit chronic pain. We describe the setup of the 1. transitional pain clinic (TPC) in Switzerland.

Materials, Methods: A retrospective chart query of orthopedic patients analysed opioid prescription at discharge. Patients on opioids at the 6 week control were identified for TPC. We presumed 3 consultations/patient and 30% of interventional approaches. Integrating TPC into our existing pain center avoids additional material/administrative investments (Fig 1).



Fia 1.

Results: In June 21, 228 patients were included. 90% were discharged on opioids, 84% without a time limit. At 6 weeks, 26% were on opioids. An 80% position covers 3600 visits/year in a 30-min pace. Projecting a positive cash flow obtained the budget for a pain physician.

During Nov'24, 88% were discharged on opioids, 48% with a time-limit (+38%). 13% (-48%) were on opioids at 6 weeks. Of 68% sent by surgeons, 23% met TPC-criteria. Examining each patient chart, we identified additional 32% on opioids. 37% had interventional pain treatments.

Discussion: This project was highly welcomed by surgeons and governance. A business plan with positive cash flow obtained the required funding. First results are seen at its start: -40% of unlimited opioid prescription, -50% prolonged opioid use. A high rate of interventional treatments is attractive for the anesthesia curriculum. Surgical TPC-address was lower than expected despite clear criteria. Negative replies were "He only takes opioids to sleep" or "Continued pain is not unusual".

Conclusion: Lack of pain specialist for patients with PPP is a gap in perioperative care. The opioid crisis is an important driver for hospital governments to support TPC.

Clear admission criteria must be defined and information on interventional pain treatments might help to bring change to the paradigm of "normal postoperative pain" trajectory.

Anesthesia management with SmartPilot® View for the first time in ENT surgeries in Turkey: a case series

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Background: The SmartPilot® View (SPV) system is an advanced anesthesia management system that provides a comprehensive visualization concept for analyzing complex drug effects and visualizing current and predicted anesthesia dept. In our country, this method was applied for the first time in anesthesia management during Ear, Nose, and Throat surgeries in our university hospital across three different cases. We aim to share our experiences with this innovative approach.

Case Report: Case 1: A 42-year-old female, 163cm, 57kg, ASAII, hard palate carcinoma.

Case 2: A 34-year-old male, 182cm, 78kg, ASAI, cervical lipoma. Case 3: A 63-year-old female, 150cm, 56 kg, ASAII, tongue cancer.

For anesthesia induction, propofol and remifentanil prepared in Braun Perfusor Space syringes which enable data transfer to the anesthesia station. Induction for all patients was achieved with Target Controlled Infusion of propofol.

Following the manual injection of 0.5mg atropine, 1mg/kg lidocaine, propofol infusion at $4\mu g/mL$ was started to achieve enough plasma concentration, followed by intubation using 0.6mg/kg rocuronium bromide.

The surgeries were conducted without any change in the hemodynamics of the patients. Based on data from the SPV for patients whose anesthesia levels deepened, the plasma concentrations of propofol-remifentanil were reduced to maintain them within the safe range.

The amount of dose was managed individually for each patient. At the end of the surgeries, the anesthetic agents infusion stopped, all patients were transferred to the PACU awake, cooperative, hemodynamically stable.

Discussion: SPV enables the analysis of patients' vital signs and plasma concentrations of administered drugs,maintaining anesthesia depth at an optimal level, preserving hemodynamic stability, and optimizing drug dosages throughout the anesthesia process. It supports fast recovery and smooth transition to the postoperative period. SPV enhances patient safety and reduces the workload of anesthesiologists. SPV facilitates timely and painless patient emergence addressing key challenges in the anesthesia process.

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Learning points: With SPV the anesthesiologist can predict the current anesthesia level and the expected course of anesthesia even while administering the drugs. This capability facilitates the optimization of anesthesia application, an algesia management.

10AP04-3

Acute right heart failure in a patient with undiagnosed pulmonary hypertension following spinal surgery: a case report

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Background: Pulmonary hypertension (PH), defined as a mean pulmonary artery pressure (mPAP) ≥ 25 mmHg, causes right ventricular overload, increasing the risk of right heart failure, and cardiogenic shock. This significantly raises morbidity, mortality and challenging perioperative management in major surgeries.

Case Report: A 72-year-old woman with hypertension, chronic bronchitis, chronic kidney disease, and previous spinal surgeries was scheduled for spinal arthrodesis (T3-Sacro) due to failed prior instrumentation.

Anesthesia was initiated with intrathecal morphine, followed by general anesthesia. Perioperative monitoring included BIS, NOL, and the Vigileo® hemodynamic monitor. During surgery, the patient experienced hypotension, 900 mL blood loss, and ventricular tachycardia, which were managed with fluid resuscitation, blood transfusion, vasopressors, and amiodarone.

Postoperatively, she was transferred to the ICU. She developed hemodynamic instability and right ventricular hypokinesis, identified via bedside echocardiography. AngioCT excluded pulmonary embolism. Shock secondary to right heart failure was attributed to hypovolemia and previously undiagnosed PH. Treatment with vasopressors and milrinone stabilized her within 72 hours.

Despite respiratory failure caused by fluid overload and chronic bronchitis, she was extubated after one week. The patient recovered after a prolonged hospitalization of 106 days and is now under close follow-up with the pulmonary hypertension unit.

Discussion: This case highlights the challenges of managing PH during major surgeries, where it often remains undiagnosed until exacerbated by surgical stress. PH places additional strain on the right ventricle, increasing the risk of failure under stressors like hypovolemia and mechanical ventilation.

Early detection, fluid resuscitation, vasopressors, and vigilant monitoring are vital for effective management. Multidisciplinary monitoring, including Vigileo for real-time hemodynamic data and Swan-Ganz catheterization to confirm elevated pulmonary pressures, was crucial in guiding treatment.

Echocardiography and AngioCT were key in excluding pulmonary embolism and identifying right ventricular dysfunction.

Learning Points: PH enhances the risk of perioperative complications, particularly right heart failure. Early detection, hemodynamic stability, and a multidisciplinary approach are essential for improving surgical outcomes in patients with PH.

Associations of intraoperative and postoperative hypotension with delirium after noncardiac surgery: a retrospective cohort analysis

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Background and Goal of Study: Postoperative delirium is a common and serious complication following noncardiac surgery. A possible precipitating factor may be intraoperative and postoperative hypotension, with subsequent brain hypoperfusion.

This study aims to investigate whether intraoperative and postoperative hypotension are associated with postoperative delirium.

Materials and Methods: We conducted a retrospective cohort study analyzing adult noncardiac surgery patients from a single academic center between 2018 and 2022. The exposure was intraoperative and postoperative hypotension, defined by lowest mean arterial pressure (MAP) or MAP reduction from baseline for cumulative 3 and 10 minutes.

The outcome was the incidence of postoperative delirium, assessed twice daily using the bCAM and CAM-ICU. Association between intraoperative hypotension with postoperative delirium was assessed through multivariable generalized mixed effects logistic regression model accounting for within-patient correlation among repeated surgeries from the same patient.

Association between postoperative hypotension and postoperative delirium was assessed through a Cox proportional model treating all the postoperative MAP as a time-varying covariate to avoid the bias that delirium-positive patients having less MAP measurements

Results and Discussion: We included 38,940 noncardiac surgeries. The incidence of postoperative delirium was 6.56%. Analysis revealed a linear association between the lowest MAP for cumulative 3 or 10 minutes and postoperative delirium, with higher MAP linked to decreased delirium risk.

The odds ratio was 0.987 (95%CI 0.974-1.001, p=0.014) when the lowest MAP for cumulative 3-minutes increased 5 mmHg, or 0.984 (95%CI 0.968-0.999, p=0.006) for cumulative 10-minutes. Relative MAP reductions showed similar associations. Postoperative MAP as a time-varying covariate had a nonlinear relationship with postoperative delirium (nonlinear p<0.001).

When postoperative MAP was less than 80 mmHg, the hazard ratio of postoperative delirium was 0.989 (95%CI 0.981-0.997, p=0.002). For postoperative MAP greater or equal to 80 mmHg, the hazard ratio per 1 mmHg increment was 1.034 (95%CI 1.023-1.045, p<0.001).

Conclusion(s): Intraoperative and postoperative hypotension, as well as postoperative hypertension, was a significant risk factor for the development of postoperative delirium, although the association was small and – on its own – probably not clinically relevant.

10AP04-7

Associations of intraoperative and postoperative blood pressure variability with delirium after noncardiac surgery: a retrospective cohort analysis

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Background and Goal of Study: Postoperative delirium is a common and serious complication following noncardiac surgery. A possible precipitating factor may be perioperative hemodynamic changes - especially rapid variability or liability blood pressure - with subsequent changes in brain perfusion.

This study aims to investigate whether blood pressure variability is associated with postoperative delirium.

Materials and Methods: We conducted a retrospective cohort study analyzing adult noncardiac surgery patients from a single academic center between 2018 and 2022. The exposure was intraoperative and postoperative mean arterial pressure (MAP) variability, defined through average real variability of MAP. The outcome was the incidence of postoperative delirium, assessed twice daily using the bCAM and CAM-ICU.

We used a multivariable generalized mixed effects logistic regression model, adjusting for with-patient correlation among repeated surgeries from the same patient. Nonlinear relationship was tested and change point analysis was performed.

Results and Discussion: In 38,940 noncardiac surgeries, the incidence of postoperative delirium was 6.56%. The association of intraoperative average real variability of MAP with postoperative delirium was non-linear, with an estimated change point at 2.6 (95% CI: 2.2, 3.1).

When intraoperative average real variability of MAP was below the change point, the estimated odds ratio of postoperative delirium per 1 unit increment was 1.024 (95% CI: 0.988-1.061, p=0.19). When intraoperative average real variability of MAP was above the change point, the estimated odds ratio was 0.961 (95% CI: 0.941-0.980, p<0.001).

The association of postoperative average real variability of MAP with postoperative delirium was non-linear, with two change point at 4.6 (95% CI: 4.4, 4.9) and 7.9 (95% CI: 7.4, 8.4).

When postoperative average real variability of MAP was <4.6, the estimated odds ratio of postoperative delirium per 1 unit increment was 0.911 (95% CI: 0.898-0.925, p<0.001); when postoperative average real variability of MAP was between 4.6 and 7.9, the estimated odds ratio was 0.925 (95% CI: 0.907-0.943, p<0.001); when postoperative average real variability of MAP was above 7.9, the estimated odds ratio was 1.129 (95% CI: 1.1.0-1.156, p<0.001).

Conclusion(s): We identified blood pressure lability to be associated with postoperative delirium, especially during the postoperative period.

Evaluation of patient feedback for Colorectal Cancer Prehabilitation Service at a tertiary teaching hospital in Central London

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Background and Goal of Study: The prehabilitation service for colorectal cancer has been established since 2021 and includes a personalised nutrition and physiotherapy led supervised exercise programme. It is often challenging to provide sufficient time in a prehabilitation programme to make a meaningful difference, without overwhelming patients through information overload and appointment burden. Successful prehabilitation relies on achieving this balance to enhance patient engagement and satisfaction. We aimed to evaluate our prehabilitation service through patient feedback.

Materials and Methods: Feedback was collected from patients who were enrolled in the prehab programme for at least 14 days between May and October 2024, and discharged following colorectal cancer surgery. Feedback was collected through telephone calls made by two anaesthetists using a questionnaire, collecting both qualitative (open ended questions) and quantitative (Likert scales) responses.

Results and Discussion: A total of 30 patients provided feedback. When asked to rank the prehab programme overall, the median value on a likert scale (0 - not beneficial, 10 - highly beneficial) was 9 (IQR = 8.25 - 10). The breakdown of components of the programmes are represented in Table 1 below.

Component of prehal	programme	N=/30	%	Median ranked score on Likert scale /10 (IQR)
	Home exercise programme only	9	30.0%	9 (IQR 8-10)
F	Face to face exercise classes	3	10.0%	10 (IQR 8-10)
Exercise programme	Online live exercise classes	14	46.7%	10 (IQR 8-10)
	None or external programme attended	4	13.4%	N/A
Dietician consultation		28	93%	9 (IQR 8-10)

Table 1.

The qualitative feedback of the exercise programmes revealed five common themes; motivating (8/30), able to tailor to the patient's needs (7/30), patients felt stronger for surgery (4/30), benefits of the inspiratory muscle trainer (4/30) and the programme being thorough/comprehensive (4/30).

Drawbacks to the programme included timing of sessions (4/30) and intensity (2/30). 8/30 patients stated they would have liked psychology input as part of the prehab programme, which is not currently offered.

Conclusion(s): The current prehab programme at our centre has consistently high rates of patient uptake and satisfaction across the multidisciplinary team. This data allows us to improve our service delivery; areas identified as needing improvement include decreasing appointment burden during a short stressful period of time before major surgery, and incorporating psychology services for some patients.

10AP04-9

Postoperative elements have the lowest compliance after implementing an Enhanced Recovery after Surgery (ERAS) protocol for liver surgery: a single center analysis

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Background and Goal of Study: ERAS has shown to improve postoperative complications and decrease length of stay after several types of surgery. The first ERAS guidelines for liver surgery were released in 2016 and updated in 2023.

The goal of this study was to assess the adherence to ERAS items and outcomes of patients undergoing liver resection after implementation of an ERAS protocol in January 2024 in a tertiary hospital.

Materials and Methods: descriptive analysis of prospective cohort. All consecutive adult patients undergoing liver resection from February to

September 2024 were included and followed up for 30 days. Collected data included patient characteristics, adherence to 23 ERAS items, complications, readmissions and Length of Stay. The discrete and continuous variables were described as number and percentage and mean (SD) or median [IQR].

Results and Discussion: 30 patients were included, 35.5% women, mean age 71 (SD 17), 40% ASA II and 57% ASA III physical status. 30% patients underwent laparoscopic surgery. The overall adherence rate to the ERAS protocol components was 85.4%. Compliance was 87% for the preoperative elements, 88% for the intraoperative and 75% for the postoperative items.

Preoperative education, nutritional optimization and preoperative fasting had 100% of adherence; PONV prophylaxys and multimodal analgesia 93% and early feeding (60%) and early mobilization (61.2%) were the items with the lowest compliance.

Patients who had open surgery had a lower overall adherence to the postoperative elements (84% vs 70%). 8 patients (26.6%) suffered postoperative complications, and median LOS was 4 days [3–7].

The overall adherence to the ERAS items was high in our cohort, with the lowest rate for the postoperative elements. Many of the components of ERAS could be considered as standard care.

Nevertheless, there are still barriers for its full implementation. Recent studies in colorectal and hepatic surgery have shown low adherence to ERAS protocols in the early postoperative phase, which was independently associated with an impaired recovery.

Conclusion(s): although compliance with the ERAS pathway was high, our results additionally support that postoperative compliance is the most difficult to achieve, and requires a multidisciplinary and motivated team. In addition, more effort should be put in patients receiving open surgery.

Influencting factors in patients' adherence to a prehabilitation program: an exploratory study

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Background and Goal of Study: The real impact of prehabilitation in the healthcare setting is controversial due to the efficacy-effectiveness gap. The effectiveness of prehabilitation in a real-world scenario has been associated with program attrition and adherence.

The aim of this study was to identify potential factors linked to patient adherence to a prehabilitation program.

Materials and Methods: This is a subanalysis of a prospective trial conceived to explore the implementation of prehabilitation in a real life setting at a tertiary hospital. Participants were patients enrolled in our multimodal prehabilitation program, candidates for major surgery, at high risk for postoperative complications and a preoperative schedule allowing \geq 4 weeks of prehabilitation.

The study variables were sociodemographic and clinical variables. The main outcome was adherence to the prehabilitation program, defined as attendance at \geq 80% of the prescribed sessions. Initial analyses were conducted to examine 1-to-1 associations between adherence and the study variables.

For categorical variables contingency tables and Fisher's exact test were used and for numerical variables, parametric (t-tests) or non-parametric (Mann-Whitney U tests) analyses were applied. A binary logistic regression model was applied to identify predictors of adherence

Results and Discussion: 782 patients were referred to our prehabilitation program. Data on adherence and compliance were available only for 559 (71.5%). According to our classification criteria, 356 (63.7%) were labelled as adherent (39.7%).

The analysis revealed significant associations between adherence and working status, type of exercise program prescribed (p<.001), smoking status (p=.023), age (t = -3.00, p = .003), comorbidities (t = -2.19, p = .029), and self-reported physical activity (t = -2.45, p = .015).

The logistic regression identified as independent factors the type of exercise prescription, smoking status, residential area, working status and neoadjuvant therapy. The model demonstrated good discriminative abilitywith an AUC of 0.777 (95% CI: 0.729 – 0.824). Specificity was high at 86.1%, sensitivity was lower at 50.6% and the predictive value (NPV) was 74.7%, indicating that the model could accurately predict that a patient would not achieve good adherence.

Conclusion: Multiple factors are associated with adherence during prehabilitation. Our model identified exhibited good accuracy and specificity, but poor sensitivity.

10AP04-11 Malta's quenching insights

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Background and Goal of Study: The complications of prolonged liquid fasting, such as dehydration, insulin resistance, increased stress response, delirium, and various postoperative complications have historically been overlooked.

Recent studies revealed that preoperative liquid fasting times remain unnecessarily long. A large-scale observational study including over 900 oncological surgery patients found an average liquid fasting duration of over nine hours, a duration beyond the recommended two hours.

Evidence suggests that shorter liquid fasting periods enhance patient well-being, reduce postoperative complications, enhance recovery, decrease hospital stays and lower healthcare costs.

The objective of this observational study is to observe current preoperative liquid fasting times in hospitals in Malta, raise awareness of the associated complications, and implement a campaign to observe shorter fasting times.

Materials and Methods: Date protection and ethical approval was obtained.

Data was collected over a period of 2 weeks between November and December 2024 from the main hospitals in the Maltese Islands where elective surgeries are carried out on a daily basis. Patients (> 18 years) scheduled for an elective procedure requiring general or regional anaesthesia or sedation were recruited. Informed consent was obtained from participants who were then interviewed whilst awaiting their surgery.

Data was collected via a standardised collection tool, anonymized and then entered into a national database for processing. Type of surgery underwent and fasting time for clear liquids (as a few sips taken most commonly with morning medications and as more than a few sips taken to relieve thirst) were noted.

Results and Discussion: 300 patients were recruited in this national observational study. Most paticipants (33.97%) underwent an endoscopy procedure under sedation.

Fasting times amongst the 82 patients who had a few sips preoperatively ranged from 30 minutes to 9 hours 20 minutes with a mean of 3 hours 45 minutes.

Fasting times for more than a few sips (for all 300 patients) ranged from 1 hour 45 minutes to 27 hours 50 minutes with a mean of 12 hours 51 minutes.

Conclusion(s): Excessive preoperative fasting is still common practice in Malta. A patient-centered approach with further education and training is recommended to prevent complications associated with this practice.

Low serratus intercostal interfascial plane block is associated with early extubation patients undergoing open hepatobiliary surgery: a single centre observational retrospective study

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Background and Goal of Study: Multimodal analgesia reduces opioid related side effects enhancing postoperative recovery. Serratus intercostal interfascial plane block (SIIPB) at the 8th rib provides analgesia at the lateral and anterior cutaneous branches of the lower intercostal nerves (T7-11).

Our objective was to analyse whether the SIIPB was an opioid sparing technique in patients undergoing open hepatobiliary surgery

Materials and Methods: Single centre retrospective study. All adult patients undergoing open hepatobiliary surgery under general anaesthesia and intrathecal morphine from October 23 to August 24 were included. Outcomes were analysed depending on whether the patient received a SIIPB or not.

Primary outcome was total i.v. morphine consumption in the first 24 postoperative hours. Secondary outcomes included Visual numeric scale (VNS) after extubation and on the1st postoperative day.

The discrete and continuous variables were described as number(%) and mean(SD) or median[IQR] and their differences analysed via Fisher's exact test or Pearson and Wilcoxon rank sum tests. P<0.05 was considered statistically significant.

Results and Discussion: 49 patients were included (24 received SIIPB and 25 no block). Patients in the no-block group received more intratecal morphine (170 vs 152mcg), less intraoperative fentanyl (248(SD160) vs 385(SD148)mcg) and more i.v. morphine before extubation (6[0–8] vs 2[0–5]mg).

More patients in the no-block group underwent cephalic duodenopancreatectomy (76 vs 37.5%). We found no differences in morphine consumption and pain scores, although SIIPB was associated with early extubation:

	SIIPB (N=24)	No block (N=25)	P value
Extubation in the operating room	24 (100%)	19 (76%)	0.022
VNS after extubation	3 [0-6.5]	3 [0-5.5]	0.462
Minimum VNS day +1, median [IQR]	0 [0–1]	0 [0-0]	0.222
Maximum VNS day +1, median [IQR]	4.5 [3-6]	5 [1.8-5.3]	0.620
Patients requiring rescue morphine (24h), n(%)	13 (54%)	12 (48%)	0.666
Morphine consumption 0-24h(mg), median [IQR]	3 [0-7]	0 [0-5]	0.475
Seating out of the bed, day, median [IQR]	1 [1–1]	1 [1–2]	0.040

Epidural use is declining due to its side effects, and combination of intrathecal morphine and truncal blocks can be a good alternative, providing adequate analgesia for extubation in the OR and early mobilization. Nevertheless our results are limited by the heterogeneous study groups.

Conclusion(s): SIIPB should be considered as part of a multimodal analgesic regime enhancing recovery in open abdominal surgery with subcostal incision.

10AP05-1

Does abdominal perfusion pressure-guided haemodynamic optimisation during elective laparoscopic colorectal surgery ensure adequate splanchnic perfusion pressure and reduce perioperative complications?

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Background and Goal of Study: In laparoscopic colorectal surgery, raised intra-abdominal pressures (IAP) from pneumoperitoneum results in decreased splanchnic perfusion pressures (SPP) due to compromise of auto-regulatory mechanisms secondary to anaesthesia. This is well documented to increase perioperative morbidity due to reduced intraoperative perfusion of major visceral organs¹.

The utility of targeting adequate SPP in averting these adverse effects has not been explored fully in a perioperative setting.

Materials and Methods: We are undertaking a retrospective study reviewing the relationship between SPP and post-operative outcomes. SPP will be measured by subtracting values of IAP from MAP. We will calculate their average intraoperative mean arterial pressure and use a constant value of IAP of 15 mmHg to calculate the SPP.

All non-pregnant adult patients ASA 1 to 3 undergoing elective colorectal laparoscopic surgery >90 minutes will be included. We will compare perioperative outcomes of patients whose SPP was maintained >/= 60 mmHg to those whose SPP was not.

Results and Discussion: The outcome of interest will be Clavien-Dindo complications and hospital length of stay. Appropriate statistical analysis will be applied taking into consideration the current 30-day morbidity and mortality rate in laparoscopic colorectal surgery of 12.4% and 1.7% respectively².

Conclusion: This study will provide feasibility data for our planned multi-centre randomised controlled trial, with a control group compared to an intervention group targeting SPP >/= 60mmHg using goal directed fluid therapy and vasopressors. We hope this will provide stronger evidence for clinicians involved in the care of these patients.

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10AP05-2

Evaluating the efficacy of home-based preoperative questionnaires in assessing patient medical readiness compared to anesthesiologist examinations

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Background and Goal of Study: Preoperative assessments are vital for identifying medical conditions and necessary workup before surgery but can be time-consuming when conducted by anesthesiologists during clinic visits.

This study evaluates whether a home-completed preoperative questionnaire can effectively replicate anesthesiologist evaluations in determining patient readiness or the need for further medical workup.

Materials and Methods: Patients scheduled for elective surgeries completed a home-based questionnaire covering perioperative history, functional capacity, current medications, and health habits like smoking before their preoperative clinic appointment. An anesthesiologist – blinded to the questionnaire results – then evaluated the patients at the clinic.

We compared the questionnaire assessments with the anesthesiologist's evaluations, considering the latter as the gold standard, to assess the questionnaire's efficacy in patient evaluation and preparation.

Results and Discussion: Out of the 415 patients who completed the questionnaires, 135 cases who complete the questionnaire and had anesthesiologist assessments were included in the final analysis. Among these patients: 51.9% (n=70) were female, 44.4% (n=60) were aged 65 or older. Agreement was found in 58.5% (n=79) of cases. A discrepancy was defined as a different outcome between the questionnaire and anesthesiologist assessments

Among the 56 discrepant cases (41.5%): 7 cases (12.5%) were not approved by the anesthesiologist, representing the most critical outcome where patient safety could be at risk. 49 cases (87.5%) involved discrepancies related to management decisions, such as providing additional instructions not covered by the questionnaire. 6 cases (10.7%) involved the questionnaire instructing patients about preoperative fasting requirements that the anesthesiologist did not mention.

Conclusion(s): The suggested home-based questionnaire shows significant potential as a safe additional screening method for preoperative anesthesiology evaluations. Its sensitivity enables anesthesiologists to focus more on high-risk cases, thereby saving time, optimizing resources, improving healthcare accessibility, and enhancing overall efficiency – all while maintaining patient safety.

Nevertheless, further development and validation of this tool are necessary to refine its effectiveness and ensure its efficacy and guarantee its integration into clinical practice.

10AP05-3

A rare cause of ischemic stroke post sedation for Drug Induced Sleep Endoscopy (DISE)

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Background: Drug induced sleep endoscopy (DISE) is a diagnostic method for patients with Obstructive Sleep Apnea (OSA) that allows the visualization of the upper airways with a flexible endoscope, while the patient is sedated. It is a quick and simple procedure, carried out on an outpatient basis.

This case describes an unusual adverse reaction following a DISE using dexmedetomidine (DEX) sedation.

Case Report: A 47-year-old male, smoker, with OSA was submitted to a DISE with positive airway pressure. Sleep was induced using a DEX perfusion, with sedation depth monitored and it occurred uneventfully.

In the post anesthesia care unit (PACU), 1 hour after, he presented an episode of bradycardia, promptly reversed with iv atropine, that motivated a longer stay. 3 hours later, he developed weakness in the right hand and dysarthria. As angio-CT confirmed a thrombus in the middle cerebral artery, he underwent emergency thrombectomy, with reversal of neurological deficits. In the months following, he experienced other 2 transient ischemic attacks and was diagnosed with peripheral venous thrombosis.

Further investigation revealed Lyme disease, for which the patient was treated with a cycle of doxycycline. In the following year he presented no further symptoms of thrombotic disease.

Discussion: DEX was believed to more accurately replicate physiologic sleep than propofol as it induces arousable sedation, with minimal respiratory depression. However, it takes longer to induce sleep and the more common side effects, bradycardia and hypotension, can persist for 3 hours after the end of perfusion.

It is impossible to determine if the initial bradycardia had any causal relationship with the subsequent neurological symptoms or if they appeared as an epiphenomenon.

As the patient exhibited solely bradycardia without any episodes of hypotension, and there is no evidence in the literature including bradycardia or DEX administration as risk factors for stroke, we lean toward the latter interpretation.

It appears fortuitous that the patient, being monitored in the PACU, received prompt diagnosis and treatment for his condition, ultimately leading to the identification of a rare preexisting clinical condition.

Learning points: This case report describes a rare and unexpected epiphenomenon following DISE, emphasizing the importance of close monitoring during and after outpatient procedures and a thorough evaluation of patients with neurological symptoms following sedation.

10AP05-5

Preventing postoperative pulmonary complications after general anaesthesia in adult surgical patients – an interim analysis

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Background: The incidence of postoperative pulmonary complications (POPC) after general anaesthesia varies between 9-40%, depending on the surgical procedure and the definition used. In 2018, the StEP collaboration introduced a standardised definition¹. Risk prediction is critical to reduce the resulting mortality². The currently best-evaluated preoperative risk score (ARISCAT³) has not yet been tested concerning the StEP endpoint.

Methods: The study represents an interim analysis of an ongoing prospective study on machine-learning-assisted risk prediction (ethics approval 369/22). Adult patients undergoing surgery under general anaesthesia were included and stratified by ARISCAT (high (HR), intermediate (IR), low risk (LR)).

We combined clinical routine data, structured patient examinations on postoperative days 1,3 and 7, and a chart review to detect POPC, defined by StEP criteria.

Results: 259 patients were included so far, of which 41% were female, 24% were smokers, ASA III was the dominant classification (65%), and the median age was 66 years. 45% patients experienced at least one POPC. POPC prevalence was highest in the HR group (Table 1). Severe complications were rare (Table 1). The most common type of POPC was respiratory failure, followed by pleural effusion and pneumothorax (Figure 1).

		ARISCAT High Risk (n = 61)	ARISCAT Intermediate Risk (n = 122)	ARISCAT Low Risk (n = 76)	p-value*
POPC Occurence		84.4%	46.1%	27.4%	<0.001
Severity	mid	97.4%	04.3%	100.0%	0.7
	sovere	2.6%	5.7%	0.0%	
Timepoint da	y of surgery	18.0%	15.6%	21.1%	40.001
	P00 1	32.8%	21.3%	1.3%	
	POD 3	6.6%	1.3%	2.6%	
	3:P007	4.9%	3.3%	1.3%	

Table 1. Descriptive statistics of endpoint POPC

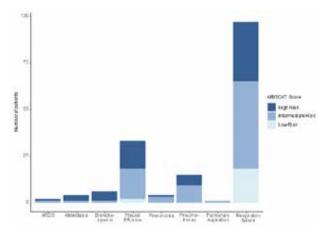


Figure 1. Distribution of different types of POPC.

Conclusion: POPC are common, and showed a higher prevalence than previously published, most likely due to the improved accuracy resulting from the prospective study design. The ARISCAT

showed good prediction of POPC. Most complications occurred during the first 48 hours, where preventive measures should have already commenced.

References:

- 1. Abbott et al. (2018) PMID: 29661384:
- 2. Fernandez-Bustamante et al. (2017) PMID: 27829093;
- 3. Canet et al.(2010) PMID: 21045639

10AP05-6

Laparostomy: an anesthetic challenge - a case of a laparostomized awake patient on spontaneous ventilation

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Background: Laparostomy allows peritonitis, ischemia and trauma treatment, facilitating re-exploration and preventing compartment syndrome. Most patients are mechanically ventilated.

Case Report: Male, 64 years old, ASA III, underwent exploratory laparotomy due to bowel obstruction. 12 days post-op, presented increased inflammatory markers and drainage of fecaloid content from the surgical wound leading to laparotomy, under general anesthesia and endotracheal intubation. Laparostomy with vacuum dressing was chosen. The patient was hemodynamically stable. without circulatory or respiratory dysfunction and, after multidisciplinary discussion, extubation and spontaneous ventilation were decided. A thoracic epidural catheter was placed. Before extubation, intravenous fentanyl and epidural ropivacaine were administered. When awake, the situation was explained to the patient. Postoperative analgesia was carried out with patient-controlled epidural analgesia protocol. The patient was assessed daily by the acute pain team. During his stay in ICU, he was conscious, cooperative and in good spirits, with controlled pain and good ventilatory dynamic. He returned to the operating room 3 days later where the abdomen was closed.

Discussion: Laparostomy allows treatment of critical conditions, being peritonitis the most common indication. Decision to keep patient intubated or to extubate depends on multiple factors. Maintaining patients supine and intubated under mechanical ventilation is more convenient, reducing risk of dehiscence and evisceration associated with agitation in awake patient. However, it creates a necessity for deeper sedation, risk of delirium and lower patient communication and satisfaction; as well as respiratory complications such as pneumonia and atelectasis. Keeping the laparostomized patient conscious and on spontaneous ventilation remains a challenge, with few case descriptions and no clear guidelines. We consider that key aspects are patient selection and collaboration; inform about risks; effective analgesia; adequate vigilance; expected time of closure.

References:

- **1.** Granger S, Fallon J, Hopkins J, Pullyblank A. An open and closed case: timing of closure following laparostomy.
- **2.** Prime D, Arkless P, Fine J, Winter S, Wakefield DB, Scatena R. Patient experiences during awake mechanical ventilation.

Learning points: Risks, benefits and indications for spontaneous ventilation in laparotomized patients; Challenges regarding analgesia and ventilation.

10AP05-7

Anesthetic management for elective bilateral vasectomy in a patient with sickle cell anemia: a case report

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Background: Sickle cell anemia (SCA) is a hereditary hemoglobinopathy associated with complications such as chronic hemolytic anemia, vaso-occlusive crises, acute chest syndrome, and an increased risk of infection (1).

Perioperative management of patients with SCA is complex and requires strategies to optimize oxygenation, hydration, temperature, hemodynamic stability, and pain management (1).

We present the anesthetic management of a patient with SCA scheduled for elective bilateral vasectomy.

Case Report: A 35-year-old male, ASA II, with a history of SCA, was scheduled for an elective bilateral vasectomy. His current medications included hydroxyurea and folic acid. He had previously undergone a cholecystectomy without anesthetic complications.

His preoperative hemoglobin value was 9.0 g/dL, and the patient was evaluated by the hematology department, which recommended the transfusion of one unit of red blood cells on the day before the surgery. His vital signs on admission were within normal limits. Standard ASA monitoring was applied along with BIS®. Normothermia was maintained using a forced-air warming blanket and a fluid warmer. Goal-directed fluid therapy was performed with crystalloid solutions. General anesthesia was maintained with sevoflurane.

Airway management was achieved with a laryngeal mask, allowing a secure airway with minimal stimulation. Prophylaxis for post-operative nausea and vomiting and multimodal analgesia were administered.

The surgery lasted 15 minutes, and the patient maintained hemodynamic stability throughout the procedure. Following the surgery, the patient was transferred to the post-anesthesia care unit and subsequently to the inpatient ward. He remained clinically stable and was discharged the following day without complications.

Discussion: The successful anesthetic management of patients with SCA provides valuable insights. In this case, the patient's elective vasectomy was performed to provide personal and lifestyle benefits.

Although this procedure is considered low-risk, meticulous anesthetic planning was essential to prevent complications associated with SCA.

References:

1. Walker I, Trompeter S, Howard J, et al. Guideline on the perioperative management of patients with sickle cell disease. Anaesthesia. 2021;76:805-817.

Learning points: With a meticulous anesthetic approach and close collaboration with the hematology team, patients with SCA can safely undergo elective procedures.

10AP05-8

Is the Montreal Cognitive Assessment test suitable for defining a postoperative delirium risk cohort? - evaluation of a mixed non-cardiac surgical patient cohort

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Background and Goal of Study: Postoperative delirium (POD) is a critical medical condition associated with increased morbidity and mortality. Preventive strategies for POD involve preoperative risk stratification, -reduction, early detection and treatment. A key risk factor for the development of POD is pre-existing cognitive impairment. The Montreal Cognitive Assessment (MoCA) has been described in the literature as a potential tool for preoperative cognitive evaluation, with a score of <26 already indicating mild cognitive impairment.

The aim of the present study is to investigate whether this threshold, or an alternative, is associated with an increased risk of POD in a university-based cohort of mixed surgical patients, and whether it can be reliably applied as a screening parameter in routine clinical practice.

Materials and Methods: At the TUM University Hospital, 2007 patients aged ≥ 65 years were preoperatively assessed with the MoCA test prior to elective surgical procedures (including visceral, thoracic, vascular, trauma, orthopedic, and urological surgeries) as part of the preoperative anesthesiology visit.

Postoperatively, patients were examined twice daily until the third postoperative day using the 3D-CAM test to assess for POD.

Results and Discussion: Considering a MoCA threshold of 26 the sensitivity for POD would be 86.1% and the specificity would be 56.5% this means that the risk of having a false positive, i.e., low MoCA and no POD would be high. Looking at the distribution of scores, the median MoCA of the patients without POD was 26 [23,28] and it was 19 [15,23] for the POD patients.

The AUC with 10k-fold bootstrapped 95% confidence intervals was 0.87 [0.77,0.87]. Accuracy would be highest for a MoCA=12 with an accuracy of 0.96. For a MoCA=26, the accuracy was 0.58

Conclusion(s): The threshold of < 26 points for defining a risk collective for POD demonstrates high sensitivity; however, in clinical practice, it could be associated with a considerable resource burden due to its comparatively low specificity.

This emphasizes the need for a composite risk score to evaluate and include the main risk domains for POD in order to focus clinical human and financial resources.

Furthermore, the question arises whether a binary classification for the risk of POD is adequate or whether a more differentiated, graded categorization of the probability of POD, considering delirium in its clinical severity levels, would be more appropriate.

10AP05-9 When serotonin runs wild - unintentionally

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Background: Nausea and vomiting is managed via different biochemical pathways. One mechanism frequently utilised is with a selective serotonin receptor antagonist - the most commonly used and studied is ondansetron, widely thought to be the "gold standard" for management of PONV. However, palonosetron - a longer-acting selective serotonin antagonist effective chemotherapy patients - is increasingly used in the peri-operative period in the past decade. The use of different drugs within the same class in different locations/settings within the hospital poses a risk of unintentional overdose which may result in serious adverse medication events.

We present a case of inadvertent repeated dosing of ondansetron given within the half-life palonosetron and suspicion of serotonin syndrome in a post-operative patient after she had returned to the general ward.

Case Report: 66 year old ASA 2 female presented for elective left breast implant reconstruction, nipple sparing mastectomy reconstruction, left nipple sparing mastectomy and level 2 axillary clearance. The patient was administered with IV palonosetron intra-operatively after discussion and request by the breast surgeon.

Anaesthesia post-operative instructions were written and IV palonosetron administration was documented and handed over to the primary surgical team.

However, post-procedurally the patient complained of non-vertiginous giddiness in the general ward and was subsequently administered with IV ondansetron within the half-life duration of palonosetron by the ward team.

Discussion: Increasingly widespread use of psychiatric medications due to increased awareness of mental health globally, prescription of analgesia which can potentially interact with the serotonin pathway.

Government funded, training hospitals comprises healthcare professionals of varying seniority and familiarity with less commonly used medication may result in inadvertent errors.

References:

Gan, T.J. (2020) Fourth Consensus Guidelines for the management of... Available at: https://www.ashp.org/-/media/assets/policy-guidelines/docs/endorsed-documents/endorsed-documents-fourth-consensus-guidelines-postop-nausea-vomiting.pdf (Accessed: 05 December 2024).

Learning points:

- Emphasises the importance of appropriate documentation and care handover between teams.
- Systems and workflow optimisation between operating theatre, post-anaesthesia care unit and the ward to prevent unintended repeated dosing of medications.

10AP05-10

Incidence of respiratory complications during deep sedation catheter ablations in patients with atrial fibrillation: a single centre retrospective study

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Background and Goal of Study: Catheter ablations (CA) in patients with atrial fibrillation (AF) are performed either under procedural sedation and analgesia (PSA) or under general anaesthesia (GA). The knowledge on the incidence and severity of respiratory complications during moderate or deep sedation for this population is limited.

The aim was to determine the incidence and severity of per-procedural respiratory complications during CA in patients with AF under PSA. This is aimed to optimize patient selection for PSA during CA.

Materials and methods: This single center retrospective cohort study was conducted in a tertiary teaching hospital in The Netherlands from October 2020 and July 2023. It involved adult, consecutive patients for a CA under PSA for AF. The ISOLATION cohort study and ISOLATION 'light' registry were approved by the ethical review boards MUMC⁺ (METC numbers 19-052, 2019 1022).

This study was conducted in compliance with the Declaration of Helsinki and the Good Clinical Practice guidelines. Per-procedural respiratory complications were defined as the use oral/nasal airway, or an indication for a non-rebreathing mask or high flow oxygen (Optiflow), or a hypoxemic event (a saturation <90% ≥120 seconds) or a conversion to GA with laryngeal mask airway (LMA) or tracheal intubation. For each hypoxemic event an AUC (by multiplying duration in minutes and the drop in saturation under 90%) were determined.

Results and Discussion: This study included 232 participants. The incidence of respiratory complications was 42.2%. An oral or nasal airway was used in 27.6% of the patients. In 13.8%, a hypoxic event occurred. In 0.9% of the cases a non-rebreathing mask was used. An Optiflow was applied in 6.9% of the cases. In 1.3% there was a cross over to GA, a LMA was placed in 0.9%. An endotracheal intubation was performed in 1 case (0.4%) due to intra-oral blood during the procedure.

There is no significant difference in lowest measured saturation and the duration of the lowest saturation between the two groups. The AUC varied from 4.0-360.0 with a mean $41.9(SD\pm68.1)$. The clinical effects of a relatively short duration of hypoxemia are yet unknown.

Conclusion: Respiratory complications during deep sedation catheter ablations in patients with atrial fibrillation occur in 42.2%. A follow-up study based on a prospective design is needed to investigate the clinical consequences of this cumulative hypoxemia.

10AP05-11 Perioperative fasting: a survey in an oncological center

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Background and Goal of Study: Preoperative fasting remains a key concern for anaesthesiologists. While necessary to reduce the risk of pulmonary aspiration, prolonged fasting contributes to patient discomfort and may disrupt homeostasis. Current guidelines advocate for more liberal protocols, yet prolonged fasting remains common in practice.

This study aims to evaluate whether fasting practices in our center align with current guidelines.

Materials and Methods: All adult patients undergoing elective surgery during a standard working week (n = 83) in our Oncological Center answered a questionnaire regarding their last dietary intake. Collected data included fasting durations for solids and clear liquids, patient-reported discomfort (scored 0–10, with 10 being the most uncomfortable), adherence to regular medication intake, understanding of fasting requirements, and the source of fasting instructions.

Results and Discussion: The mean fasting durations were 12 hours for solids and 11 hours for clear liquids, with only 25% of patients consuming water 2–8 hours before surgery. No patients were identified as having an insufficient NPO period. Additionally, 56% of patients skipped their regular medications despite no specific instructions to do so. Fasting was associated with notable patient discomfort, with 66% of patients reporting moderate or severe discomfort (scores >3).

Moreover, over half of patients (56%) lacked a clear understanding of the rationale for fasting, often citing inadequate explanations. This may be linked to the fact that the majority of fasting instructions were given by the nursing staff (≥50%).

Addressing these challenges remains essential in high quality perioperative care making it is essential for anaesthesiologists to prioritize educating both patients and healthcare staff on fasting protocols to ensure adherence to evidence-based practices.

Conclusions: Our findings highlight that, despite efforts to implement updated guidelines, patients often experienced prolonged fasting durations, particularly for clear liquids.

Following this survey, we revised our internal fasting protocols and initiated educational sessions for ward nursing staff to promote adherence to current best practices. We plan to assess the effectiveness of these interventions through a future audit

10AP05-12

Analgesia for total minimally invasive oesophagectomy: a 6-year audit in a cancer centre

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Background and Goal of Study: Oesophagectomy transitioned to a totally minimally invasive technique (TMIO) by 2019 in our center. While the surgical approach has been standardized, optimal analgesic strategy for TMIO remains a debate, given its reduced invasiveness compared to traditional procedures. This study aims to provide a descriptive analysis of our Acute Pain Unit's management of TMIO patients over a six-year period.

Materials and Methods: we included all patients who underwent TMIO at our center from January 2019 - November 2024 (n = 161). Patients were categorized into five study groups based on the analgesic protocol used:

Paravertebral Continuous Infusion + Patient Boluses (PVB)	0.1% ropivacaine, 4–8 mL/h basal rate, 4 mL bolus, 30-min lockout.
CEI + Patient-Controlled Epidural Analgesia (PCEA)	0.1% ropivacaine \pm 20 mcg/mL morphine, 4–8 mL/h basal rate, 4 mL bolus, 30-min lockout
Continuous Epidural Infusion (CEI)	0.1% ropivacaine \pm 50 mcg/mL morphine, 4–8 mL/h
Spinal Morphine + Morphine PCA (Spinal)	No background infusion, 1 mg bolus, 8-min lockout
Morphine PCA (PCA)	infusion 0.3-0.5 mg/h, 1 mg bolus, 8-min lockout

We performed a descriptive analysis of patient demographics, pain scores, opioid requirements (IV morphine milligram equivalents - MME), and incidence of complications, namely hypotension (defined by mean arterial pressure or need for fluid boluses and/or vasopressors) and pulmonary morbidity (need for oxygen or ventilatory support). Then we compared the main groups for these outcomes.

Results and Discussion: The mean age of the patients was 65 years, with a majority being male (82%). 38% of patients were classified as ASA II, while the remaining 62% were ASA III. The table below briefly describes the main results for each group:

Modality	PCA	Spinal	CEI	PCEA	PVB
N (%)	33 (20,5%)	22 (13,7%)	47 (27,3%)	54 (33,5%)	8 (5,0%)
Intraop MME, mean (SD)	57,2 (16,7)	83,9 (28,9)	40,0 (12,1)	41,1 (13,5)	63,3 (18,4)
IV MME D5 cumulative, mean	88,7 (33,6)	61,0 (34,4)	117,7 (63,5)	71,7 (40,0)	42,2 (29,3)
NRS at rest D1-D3-D5, median	0.0 - 0.0 - 0.0	0.0 - 0.0 - 0.0	0.0 - 0.0 - 0.0	0.0 - 0.0 - 0.0	0.0 - 0.0 - 0.0
NRS on movement D1- D3-D5, median	4.0 4.0 - 2.0	3.0 - 2.0 - 3.0	2.0 - 3.0 - 2.0	3.0 - 3.0 - 3.0	3.5 - 4.5 - 3.0
Hypotension D1, n(%)	16 (48,5%)	11 (50%)	33 (75%)	34 (63%)	2 (25%)
O2/ventilatory support D1, n(%)	24 (72,7%)	17 (77,3%)	23 (52,3%)	44 (81,5%)	6 (75%)

Adequate analgesic control was achieved across all study groups, as demonstrated by consistently low NRS scores. When the main analgesia groups were compared (PCA vs CEI + PCEA), differences became apparent: upon movement, pain is better controlled with epidural techniques (p 0.002), which comes with an increased incidence of hypotension (p 0.040).

Conclusions: While all modalities demonstrated adequate pain relief and similar clinical outcomes, further research is required to determine how to tailor analgesia strategies to individual patients.

10AP06-1

Systematic review of the optimum haemodynamic monitoring strategy for patients following oesophagectomy

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Background and Goal of Study: Oesophageal cancer has the 7th highest mortality globally, and the main stay of treatment is oesophagectomy¹.

Oesophagectomies are complex, involving both abdominal and thoracic phases, lymph node clearance and ligation of vascular supplies to the organs involved. Consequently, oesophagectomies have a complication rate of up to 63%, with anastomotic leaks being common².

Haemodynamic optimisation has been identified as a key factor in maintaining anastomotic perfusion to reduce the risk of anastomotic leak³.

This systematic review aims to identify the most appropriate haemodynamic monitoring strategy for patients following oesophagectomy.

Methods: A comprehensive search strategy was performed on MEDLINE via Pubmed, MEDLINE via OVID, Embase via OVID and Emcare via OVID. Search terms included 'oesophagectomy or esophagectomy or oesophogastrectomy' and 'hypotension or haemodynamic(s)'.

Papers were screened using predetermined inclusion and exclusion criteria. Papers were screened by three independent reviewers (MH, SP, AB) using Rayyan (an application for systematic reviews) and conflicts were resolved by discussion. Following data extraction, risk of bias assessment was performed using the Cochrane risk of bias tool for RCTs, and Newcastle-Ottawa tool for non-RCTs.

Results and Discussion: The initial search retrieved 859 citations. Following title and abstract screening 35 citations were retrieved for full text screening. Following full text screening 13 citations were progressed to data extraction. Studies included 3 RCTs, 6 prospective observational studies, 3 retrospective observational studies, 1 systematic review and included 891 patients.

Many trials assessed the incidence of anastomotic leaks as a secondary outcome. Data extraction revealed heterogeneity in outcomes reported, haemodynamic targets and measurement methods.

Conclusion: Generalisability of the results is limited due to the heterogeneity and quality of the studies retrieved, and the lack of RCTs assessing anastomotic leaks as the primary outcome.

Further research into haemodynamic monitoring is justified and a core outcome set is required to produce generalisable evidence.

References:

- 1. https://gco.iarc.who.int/media/globocan/factsheets/cancers/6-oesophagus-fact-sheet.pdf
- 2. Linden PA et al. Gastroint Surg. 2020;24:1948-54.
- 3. Choudhuri et al. International Journal of Critical Illness and Injury Science. 2013;3:246-9.

10AP06-2

Validation of the parsimonious NELA model in emergency abdominal surgery

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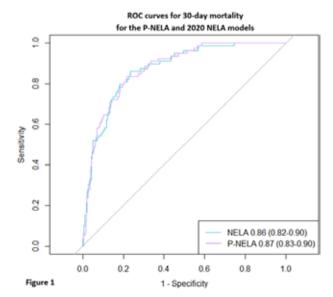
Background and Goal of Study: Emergency abdominal surgery has high postoperative mortality. While the National Emergency Laparotomy Audit (2020 NELA) model predicts mortality well, its complexity limits clinical use. The Parsimonious NELA (P-NELA) model simplifies predictions with only 13 variables.

This study externally validates the P-NELA model in a Danish cohort and compares it to the 2020 NELA model. We hypothesized that P-NELA performs well and comparably to NELA.

Materials and Methods: This retrospective study included adult patients undergoing emergency laparoscopy or laparotomy at Copenhagen University Hospital – Herlev between March 2017 and January 2020. We excluded appendectomy, cholecystectomy, and negative diagnostic procedures. Data was extracted from electronic patient records. The outcome was 30-day mortality. Model performance was assessed using discrimination (Area Under the Curve [AUC]) and calibration (Integrated Calibration Index, slope, and intercept). Missing data were imputed using multiple imputations. We performed a sensitivity analysis of complete cases.

Calibration	P-NELA model	2020 NELA model
Integrated calibration index	0.042	0.045
Calibration intercept	0.05 (0.04-0.08)	0.05 (0.03-0.07)
Calibration slope	1.08 (1.06-1.10)	1.09 (1.07-1.12)

Table 1. For a perfectly calibrated model, the Integrated Calibration Index would be 0, calibration intercept 0 and calibration slope 1.



Results and Discussion: Out of the 679 included patients, 90 (13.3%) died within 30-days. P-NELA demonstrated an AUC of 0.87 (95% CI: 0.83–0.90), comparable to the NELA model (AUC: 0.86, 95% CI: 0.82–0.90). Calibration was similar for the two models, and both tended to underestimate 30-day mortality. Sensitivity analyses supported the robustness of the findings.

Conclusion(s): The P-NELA model performed well in this external validation, with predictive accuracy comparable to the 2020 NELA model, suggesting that a high number of variables in risk prediction models is not always necessary.

10AP06-3

Predicting postoperative infectious complications – a systematic review of current prediction models and their validation and implementation status

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Background and Goal of Study: Preoperative assessment of postoperative infection risk can help identify patients for personalized decision making and management. This systematic review evaluates existing prediction models for infection, focusing on their validation and implementation status.

Materials and Methods: Pubmed, Embase and the Cochrane Library were searched studies on the development, validation- and implementation of multivariable models utilizing preoperative predictors to estimate the risk of postoperative infections occurring within 30-days of elective, non-cardiac and non-intracranial surgical procedures.

Results and Discussion: We included 152 studies in total. Eightyseven studies described model development (267 models) and 86 studies assessed model validity (311 model validations of 41 unique models). No studies reported on model implementations. Most studies predicted surgical site infections (SSI, n=88 models), pneumonia (45 models) and infection in general (n=57). Most frequently incorporated predictors included age (66%), sex (53%) and ASA score (48%). Predictors were incompletely reported for 80 models. The American College of Surgeons National Surgical Quality Improvement Program surgical risk calculator (ACS NSQIP SRC) and SUrgical Risk Preoperative Assessment System (SURPAS) demonstrated most robust validation status, with 222 and 35 external validations, respectively. Reported c-statistics of the ACS NSQIP SRC were median 0.61 (0.43 - 0.85), 0.66 (range 0.44 - 0.95), and 0.64 (0.31-0.97) for prediction of SSI, pneumonia, and urinary tract infection (UTI), respectively. Median c-statistics of the SURPAS were 0.62 (range 0.52-0.78) and 0.59 (0.52-0.82) for UTI and general infection, respectively. Overall, most studies scored high risk of bias.

Conclusion(s): An abundance of prediction models for postoperative infection have been developed, with ACS NSQIP SRC and SURPAS being the most thoroughly validated. However, the clinical utility of even these models seems limited by poor predictive performance, and no implementations were identified.

10AP06-4

Probiotics in the perioperative period: optimising postoperative pain

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Background and Goal of Study: The close relationship between the gut microbiome and pain perception is now well established. Procedures such as surgery, general anaesthesia or antibiotics can alter the homeostasis of the microbiota. The composition of the microbiome is known to influence the development, expression and progression of several diseases.

PROBIOTIC ADMINISTRATION PROTOCOL FOR ENHANCED POST-OPERATIVE PAIN CONTROL

General and objetives

Surgical procedures, the use of general anaesthesia and other perioperative factors significantly alter the diversity and composition of the gut microbiota, which can exacerbate local and systemic inflammation and delay postoperative recovery. Restoring the balance of the gut microbiome aims to:

- Reduce inflammation.
- Reduce post-operative somatic and visceral pain.
- Reduce the need for post-operative analogsics.
- · Promote faster gut recovery.

Indications

- Patients undergoing gastrointestinal surgery, major surgery elsewhere and/or general anaesthesia.
- Procedures involving preoperative mechanical bowel cleansing.
- Patients with chronic diseases with altered microbiota (irritable bowel syndrome, inflammatory bowel disease, diabetes, cirrhosis, non-alcoholic fatty liver disease, oncology patients, etc.).
- · Patients with chronic pain.
- Patients on antibiotic treatment.

Contraindications

- · Allergies or intolerances
- Severely immunosuppressed patients
- Presence of active systemic infection
- Risk/benefit assessment in pregnant women

Intervention

Probiotic Selection and Mechanism of Action

- Lactiplantibacillus plantarum exerts anti-inflammatory effects through the production of IL-10 and IL-4 and by directly limiting the production of pro-inflammatory cytokines such as TNF.
- Combinations of Lactobacillus spp. and Bifidobacterium spp. strains have antinociceptive effects by
 modulating pain signalling through the production of neurotransmitters such as GABA.
- L. acidophillus NCFM and L. salivarus Ls-33 induce increased expression of µ-opioid receptor mRNA (OPRM1). L. acidophillus NCFM also induces significant expression of cannabinoid receptor (CNR2) mRNA.
- Saccharomyces boulardii CNCM I-745: Prevention of diarrhoea associated with antibiotic treatment and Clostridium difficile.

Timing of Administration

- Start: 5 to 7 days before surgery
- Continuation: Up to 14 days postoperatively, depending on clinical evolution and patient tolerance.
 Dosage
- Lactiplantibacillus plantarum: ≥10^10 CFU/day.
- Lactobacillus spp.: ≥10^9 CFU/day.
- Bifidobacterium spp.: ≥10^9 CFU/day.
- . L. acidophillus NCFM: 2.5-5 x 10^9 CFU/day.
- L. salivarus Ls-33: ≥10^9 CFU/day.
- Saccharomyces boulardii**: 1-2 x 10^9 CFU/day or 250-500mg/day.

*Administer at commercially available standardised doses.

**Consider administration if antibiotic treatment is prolonged

- Route of Administration

 Oral, preferably in capsules or soluble sachets.
- For patients with oral restrictions, compatible formulations for gavage administration should be considered.

Evaluation and monitoring

Pre-operative

- Consider a stool culture study beforehand to assess the composition of the microbiota and personalise the intervention, especially in patients with chronic diseases.
- · Evaluate digestive tolerance to the probiotic (diarrhoea, constipation, flatulence etc.).

Post-operative period

Monitor digestive symptoms, use acute pain scales, assess control with analytical inflammatory parameters and a new stool culture.

Therefore, it seems reasonable to consider the use of probiotics in the perioperative period as a therapeutic option, given their involvement in the modulation of pain and inflammatory response. The present study aims to establish a probiotic administration protocol to improve postoperative pain control.

Materials and Methods: A systematic review of the literature was conducted using search engines (PubMed, ScienceDirect, TripDatabase and Google Scholar), as well as books and clinical practice guidelines on the subject.

A protocol for the administration of probiotics in the perioperative period was developed based on the most recent evidence-based recommendations.

Results and Discussion: Probiotics have gained popularity in the field of gut microbiome and perioperative medicine. Although there are doubts about their efficacy in preventing postoperative intestinal complications, good data on their use in modifying the intestinal environment and reducing inflammation have led to their use in reducing postoperative pain. In this context, we present a protocol (*Table*) on its use developed in our centre.

Conclusion(s): The inclusion of probiotics in perioperative management is an emerging and promising strategy in patient prehabilitation due to its potential effects on postoperative pain.

However, further clinical research is needed to standardise protocols given the heterogeneity of different probiotic formulations, doses and duration of treatment.

10AP06-5

Cancer patients can achieve moderate to high intensities during supervised online exercise classes: a pilot study at a tertiary teaching hospital in central London

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Background and Goal of Study: Exercise programs for cancer patients before and after surgery can improve surgical outcomes and recovery. Online delivery helps overcome logistical barriers to healthcare access, reducing travel time, costs and work-related disruptions. Achieving recommended moderate to high intensity levels improves their effectiveness.

This study aims to describe the exercise intensity achieved during a 60 minute online supervised exercise class.

Materials and Methods: Twelve adults (M:F 1:1, mean age 62.5 \pm 9 years) with colorectal or thoracic cancer enrolled in an online supervised exercise program from September to November 2024. All patients were scheduled for, or had recently undergone surgery.

Aerobic intensity was assessed using the patient's own fitness wearables or pulse oximeters provided by the hospital. Patients' heart rates (HR) were recorded at 5 and 10 minutes into the aerobic exercise.

Corresponding % Heart Rate Reserve (%HRR) zones were calculated at analysis, using the Karvonen formula (moderate intensity: 40–59%; high intensity 60–80%). Rate of Perceived Exertion (RPE) scores were recorded at 5 and 10 minutes into the strength exercises (moderate-to-high intensity: RPE 4-6/10 or higher). Baseline activity levels were assessed using the GODIN Leisure Time Activity Questionnaire (GLTAQ).

Results and Discussion: In total, 24 HR readings (2 per patient) were collected during aerobic exercise, with 71% corresponding with a moderate-to-high intensity %HRR (moderate:25%; high: 46%). Strength training elicited moderate-to-high RPE scores in 88% of datasets.

Overall, 100% of patients reached moderate-to-high intensity in at least one exercise component. Baseline GLTAQ scores categorised patients as 'sedentary' (n=7), 'moderately active' (n=2), and 'active' (n=3). 'Active' patients achieved consistent moderate-to-high intensity levels compared to 'moderately active' and 'sedentary' patients (100%, 75% and 50%, respectively).

Conclusion(s): The majority of patients reached moderate-to-high intensity during aerobic and strength components of the online supervised exercise program. These findings demonstrate the feasibility of delivering effective online exercise interventions. Our findings suggest that patients who are deemed 'sedentary' at baseline, may require supplementary strategies to optimise target intensities. Future research should explore strategies to optimise outcomes across varying baseline fitness levels.

10AP06-6

The association between perioperative acetaminophen administration and postoperative delirium

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Background and Goal of Study: Postoperative delirium (POD) is a frequent complication in older surgical patients and is linked to higher morbidity and mortality. Acetaminophen is widely used for perioperative analgesia, but its effect on POD remains unclear. We hypothesized that the perioperative use of acetaminophen decreases the risk of POD.

Methods: 29,830 hospitalized patients aged ≥60 years undergoing non-cardiac, non-neurosurgical procedures under general anesthesia were included. The primary exposure was acetaminophen administration at any time between holding area admission until discharge from post-anesthesia care unit.

The primary outcome was POD within 7 days, identified based on International Classification of Diseases (ICD) codes, Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) scores, and manual chart review. Inverse probability-weighting-regression-adjustment was applied for the primary analysis.

Results: 23,914 (80.2%) patients received acetaminophen and overall 1,141 (3.8%) patients experienced POD within 7 days. The risk of POD was lower in patients receiving acetaminophen, with an average treatment effect (ATE) of -1.3% (95% confidence interval [CI] -2.0 to -0.6; number needed to treat [NNT]=77; p<0.001). This association varied by timing of acetaminophen administration.

Preoperative use showed the largest reduction in POD risk, with an ATE of -1.9% (95% CI -2.8 to -1.1; NNT=53; p<0.001), followed by postoperative use (ATE -1.4%; 95% CI -2.4 to -0.4; NNT=71; p=0.007), and combined pre- and postoperative use (ATE -0.9%; 95% CI -1.7 to -0.2; NNT=111; p=0.017).

Conclusion: Perioperative acetaminophen use was associated with a lower risk of POD, particularly when administered before surgery.

Patient characteristics	No acetaminophen N=5,916	Acetaminophen N=23,914	Absolute standardized difference
Age, years	71.7 ± 8.3	71.0 ± 7.9	0.081
Female Sex	2,854 (48.2%)	12,738 (53.3%)	0.101
Body mass index, kg/m²	28.0 ± 6.4	28.4 ± 6.3	0.073
Federal Insurance	3,601 (60.9%)	14,076 (58.9%)	0.041
Household Income, \$	114,262 ± 41,869	115,005 ± 41,399	0.018
Preoperative factors			
Elixhauser comorbidity index	11 (3 - 21)	7 (1 - 17)	0.231
ASA physical status classification	3 (2 - 3)	3 (2 - 3)	0.181
History of alcohol abuse	470 (7.9%)	1,316 (5.5%)	0.098
History of drug abuse	283 (4.8%)	980 (4.1%)	0.033
History of anemia	551 (9.3%)	1,705 (7.1%)	0.080
History of psychosis	65 (1.1%)	184 (0.8%)	0.034
History of stroke	172 (2.9%)	467 (2.0%)	0.062
History of depression	1,558 (26.3%)	5.867 (24.5%)	0.041
History of pain related diagnosis	4.495 (76.0%)	17.906 (74.9%)	0.026
History of opioid use	2,629 (44.4%)	11,125 (46.5%)	0.042
History of benzodiazepine use	640 (10.8%)	3,038 (12,7%)	0.059
Preoperative intensive care unit stay	306 (5.2%)	558 (2.3%)	0.150
Preoperative baseline pain score	0.0 (0.0 - 4.0)	0.0 (0.0 - 3.0)	0.020
Nil per os time, h	13.0 (9.7 - 16.1)	11.9 (8.5 - 15.1)	0.205
Same day admission	3.271 (55.3%)	19.058 (79.7%)	0.540
Intraoperative factors			
Duration of surgery, min	136.0 (89.5 - 201.0)	180.0 (130.0 - 257.0)	0.428
Emergency surgery	727 (12.3%)	1,784 (7,5%)	0.162
Work relative units	14.5 (6.9 - 21.2)	18.2 (13.2 - 24.4)	0.394
Use of regional anesthesia	847 (14.3%)	4,225 (17.7%)	0.092
NSAID administration	636 (10.8%)	3,963 (16.6%)	0.170
Propofol dose, mg	180.0 (130.0 - 220.0)	200.0 (150.0 - 230.0)	0.067
Vasopressor dose, mg norepinephrine egulvalents	0.1 (0.0 - 0.3)	0.1 (0.0 - 0.4)	0.004
Ketamine administration	520 (8.8%)	3,648 (15.3%)	0.200
Dexmedetomidine administration	135 (2.3%)	893 (3.7%)	0.085
Age-adjusted mean alveolar concentration of inhalational anesthetics	0.9 (0.7 - 1.1)	1.0 (0.8 - 1.1)	0.303
Crystalloid and colloid infusion, ml	1000 (600 - 1500)	1200 (800 - 1700)	0.216
Night surgery	384 (6.5%)	649 (2.7%)	0.181

Table 1. Patient characteristics and distribution of variables.

10AP06-7

Age- and sex-specific cut-offs for functional capacity and their predictive value for postoperative outcome in non-cardiac surgery – a secondary analysis of the international MET-REPAIR study

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Background and Goal of Study: Poor functional capacity is a widely used risk factor for adverse postoperative cardiac complications after non-cardiac surgery. Age is a potential confounder in the association between poor functional capacity and adverse outcome. Also, the impact of sex as additional modifier is increasingly investigated.

The aim of this study was to explore if risk prediction for postoperative adverse cardiac events was improved using sex- and age-specific cut-offs for functional capacity in patients submitted to non-cardiac surgery.

Materials and Methods: This is a secondary analysis of the international MET-REPAIR study, a prospective cohort study including non-cardiac surgery patients ≥ 45 years with increased cardiovascular risk. Functional capacity was estimated in metabolic equivalents (MET) using a validated questionnaire.

Primary endpoint was the incidence of major adverse cardiovascular events (MACE) at 30 days. Clustering methods were employed for detection of age- and sex-specific cut-offs.

Multivariable logistic regression models were calculated using general and age- and sex-specific cut-offs for functional capacity.

Results: Of 15,158 patients, 5,944 (39.2 %) were female. Based on clustering, cut-off for functional capacity in each sex primarily depended on presence of cardiac risk factors according to the Revised Cardiac Risk Index (RCRI) and whether patients were submitted to high-risk surgery. Age also played a role in categorization in risk groups, even though a secondary one.

Overall, after employing age- and sex-adapted cut-offs for functional capacity 5,238/9,214 (56.8%) men and 3,963/5,944 (66.7%) women presented with limited functional capacity.

The strength of the association between limited functional capacity and 30-day MACE was similar when using a general cut-off of 4 METs (OR_{4METs} = 1.22, 95% CI 0.97-1.55) and when using an age- and sex-adapted one ($OR_{adaptedMETs}$ = 1.17, 95% CI 0.92-1.48). The ROC AUC of a model including RCRI and age was 0.654 (95% CI 0.622-0.686) after the addition of limited functional capacity based on the general cut-off and 0.653 (95% CI 0.622-0.685) after the addition of age- and sex-adapted cut-offs.

Conclusion: Age- and sex-specific cut-offs for functional capacity did not improve risk prediction for MACE after non-cardiac surgery.

10AP06-8 A case of Horner's syndrome following central venous catheterization

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Background: Horner syndrome (HS) is a neurological syndrome characterized by ipsilateral miosis,ptosis and anhidrosis due to sympathetic nerve trunk(SNT) block or injury. The syndrome has been described as a rare complication of central venous catheter (CVC) insertion, with an incidence of less than 5% after internal jugular vein (IJV) catheterization.

Case Report: A 31-year-old man with testicular cancer was scheduled to receive a CVC for chemotherapy. The procedure was performed by senior trainee without ultrasound guidance. After anesthetising the skin with local anesthetic lidocaine and initial unsuccessful puncture of the right IJV,CVC was placed from the left IJV, and position was confirmed with fluoroscopy.

Immediately after catheterization,patient reported "difficulty seeing" with right eye and blurred vision. Neurological examination revealed ptosis and miosis of the right upper eyelid. The symptoms were considered as transient HS caused by sympathetic nerve block caused by local anesthesia.

As the symptoms did not improve the next day, the patient was examined by neurologist who confirmed HS on the right side, most likely caused by SNT injury with the needle, while the other findings were normal.

Discussion: Previous studies have shown that, injury to the cervical SNT causing HS were reported as being uncommon, with an incidence up to 2%, and the incidence increases when the procedure is performed by trainees. The right IJV is the preferred site for CVC insertion due to its predictable anatomy,high success rate and low risk of complications. CVC insertion can cause HS in several ways, due to direct damage to the sympathetic chain, direct damage to the peri-subclavian nerve loops, and hematoma of the associated vessels (especially if the hematoma is trapped in the carotid sheath).

Recommendations to reduce the incidence of HS after a CVC include:direct ultrasound guidance;avoiding too steep needle angle; tilting head no more than 40 degrees lateral, and avoiding a posterior approach.

Conclusion: HS is a rare complication of a common procedure, the insertion of a CVC, that can easily prevented by using ultrasound guided technique and with higher education and experience.

References:

- Dias et al. Horner Syndrome After Central Venous Catheterization. Journal of Neuro-Ophthalmology 2,2024;44(4):508-509.
- 2. Butty Z et al. Horner's syndrome in patients admitted to the intensive care unit that have undergone central venous catheterization: a prospective study. Eye 2016;30(1):31–33.

10AP06-9

Perioperative shock with complete recover after targeted treatment – a case report

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Background: Postoperative hemodynamic instability and depressed level of consciousness are common conditions with a broad differential diagnosis. Diabetic ketoacidosis (DKA) is a lifethreatening complication of type 1 or type 2 diabetes mellitus. It is characterized by metabolic acidosis with an increased anion gap, elevated capillary or urinary ketones, and hyperglycemia or euglycemia¹.

Given its nonspecific presentation, maintaining a high index of suspicion for DKA in the perioperative period is critical.

Case Report: We report the case of a 79-year-old male (ASA III) with a medical history of non-insulin-dependent type 2 diabetes mellitus treated with sodium-glucose co-transporter-2 inhibitors (SGLT2i) and peripheral vascular disease. The patient underwent an elective femoral endarterectomy under balanced general anesthesia, with an uneventful intraoperative course.

About two hours postoperatively in the Post-Anesthesia Care Unit, the patient developed sudden hemodynamic instability and a depressed level of consciousness, requiring vasopressor support to maintain a mean arterial pressure above 65 mmHg. No clear etiology was initially evident.

Arterial blood gas analysis revealed metabolic acidosis with an increased anion gap and elevated capillary ketones. Immediate treatment included fluid resuscitation with 5% dextrose in polyelectrolyte solution and an insulin infusion at 6 U/h. Over the following 12 hours, the patient showed gradual clinical improvement with resolution of the acidosis and normalization of bicarbonate levels.

Discussion: Euglycemic DKA is a life-threatening condition characterized by the triad of serum glucose levels typically <11.0 mmol/L, metabolic acidosis with an increased anion gap and ketonemia. Risk factors include infection, missed insulin doses, SGLT2i use and comorbidities commonly seen in surgical patients^{1,2}.

The global increase in SGLT2i prescriptions has made euglycemic DKA a more frequent diagnosis. A thorough preoperative clinical history is essential for risk stratification. Early recognition and intervention are key to reversing this condition and preventing complications².

References:

1. BJA Education. 2016. Volume 16, Issue 1, 8-14;

2. J Anesth. 2023 Jun;37(3):465-473.

Learning Points: DKA should be considered a differential diagnosis for shock in the perioperative period. Awareness of predisposing factors and mastery of the presentation and management of DKA can improve perioperative outcomes.

10AP06-10

The effectiveness of low-dose ketamine in reducing postoperative pain after abdominal surgery: a randomized, double-blind, placebo-controlled study

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Background and Goal of Study: Postoperative pain management is a critical component of recovery following abdominal surgery. Despite advances in postoperative pain management, the reliance on opioids remains high, contributing to significant side effects and prolonged recovery. Ketamine, particularly in low doses, has shown promising potential as an adjunct for pain relief but its optimal dose and clinical utility in reducing opioid consumption and postoperative pain in abdominal surgery remain underexplored, particularly in diverse patient populations.

This study aimed to evaluate the efficacy of low-dose intravenous ketamine in reducing postoperative pain and opioid consumption, with the potential to significantly improve patient outcomes.

Materials and Methods: A total of 60 patients, aged 18-75, scheduled for elective abdominal surgeries such as appendectomies, cholecystectomies, or hernia repairs under general anesthesia were randomly assigned to receive either 0.5 mg/kg of intravenous ketamine (Group A), 0.1 mg/kg (Group B), or a placebo (Group C) just before incision.

The primary outcome was the total opioid consumption in the first 24 hours postoperatively. Secondary outcomes included pain scores at rest and on movement, nausea, vomiting, and adverse events such as hallucinations or sedation.

Data were analyzed using SPSS (version 25). ANOVA was used for comparisons of continuous variables, and chi-square tests for categorical variables. A P-value < 0.05 was considered statistically significant.

Results and Discussion: Group A demonstrated a significant reduction in total opioid consumption compared to both Group B and Group C (P = 0.02). Pain scores at rest and on movement were significantly lower in Group A at 4, 8, and 24 hours post-operatively (P < 0.05). No significant differences were observed in the incidence of nausea, vomiting, or hallucinations between groups.

Conclusion(s): Low-dose intravenous ketamine (0.5 mg/kg) has been shown to effectively reduce postoperative pain and opioid consumption in patients undergoing abdominal surgery. Importantly, this reduction in pain and opioid use is achieved without an increase in adverse events, providing a safe and effective option for postoperative pain management.

10AP06-11

Air embolism after removal of a central venous catheter in the postoperative period of a liver transplant

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Background: Air embolism consists of the entry of air into the venous or arterial circulation. It is a rare complication, mainly iatrogenic, associated with invasive medical procedures with high morbidity and mortality. Severe forms are characterized by the sudden appearance of neurological symptoms together with cardiovascular manifestations after an invasive procedure. Performing imaging tests that reveal air bubbles in the vascular structures confirms the diagnosis.

Case Report: We present the case of a 63-year-old woman who presented a venous air embolism after the removal of a central venous catheter in the postoperative period of a liver transplant due to chronic liver cirrhosis due to hepatitis C virus.

This woman presents with a sudden decrease in the level of consciousness with deviation of gaze to the left, accompanied by hypoxemia and atrial fibrillation with a rapid ventricular response, after removal of a central venous catheter. Given the suspicion of air embolism, the bed was placed in Tredelemburg, non-invasive high-flow ventilatory support and hemodynamic support.

An urgent echocardiography was performed, which showed the presence of abundant air bubbles in the left cavities, and a cranial CT scan showed an air bubble was seen in the right cavernous sinus and intramedullary in the sphenoid body.

After clinical stabilization, the patient presented bradypsychia, left facial paralysis and complete left hemiplegia, which progressively improved throughout her stay in the unit. A brain MRI was performed in which ischemic lesions were seen in the right prefrontal cortex suggestive of ischemic origin.

Discussion: Air embolism is a rare and very serious complication of different medical-surgical procedures, potentially avoidable. The incidence is unknown due to the wide variety of clinical manifestations that can range from mild to cardiovascular collapse and death. In our unit, when faced with an adverse incident, we investigated how to avoid it. A protocol for the insertion, management and removal of central lines was created and distributed among the unit staff.

References:

Requenas et al. Embolismo aéreo venoso: una causa poco común de ictus isquémico agudo. 10.1016/j.regg.2014.09.00**Learning points:**

- Air embolism is a potentially fatal iatrogenic complication.
- Staff training is essential to reduce the incidence of adverse events.

10AP06-12

Myxedema coma following urgent subdural hematoma drainage surgery: a case report

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Background: Postoperative altered mental status demands a careful and systematic evaluation. While drug related effects or neurological complications are common considerations, others diagnoses must be excluded. Myxedema coma is a rare and severe cause specially in older adults with thyroid dysfunction.^{1,2} This report highlights a case of myxedema coma in the postoperative of an urgent subdural hematoma (SDH) drainage.

Case Report: A 92-years-old women with medical history of hypertension and hyperthiroidism, medicated with lanzoprazol 15 mg id, furosemide 40 mg id, perindopril 5 mg id, levetiracetam 500mg 3id, atorvastatina 10 mg id and methimazol 5 mg id, presented to the hospital with altered mental status scoring 9 to 14 in the Glasgow Coma Scale (GCS).

After drainage of SDH, under general anesthesia, the patient was transfered to the post-anesthesia care unit (PACU) but did not show the expected improvement, with a persistent GCS of 9. Other diagnosis were discussed, namely drug related effects and thyroid disfunction. The laboratory tests revealed a severe hypothyroidism (free thyroxine 0,11 ng/dl and thyroid-stimulating hormone 109 uU/ml).

After urgent endocrinological consultation the patient begun 200 mcg of intravenous levothyroxine followed by 25mcg orally with a rapid and significant improvement. The patient was discharged from PACU with a GCS 15.

Discussion: This case reinforces the importance of considering endocrine dysfunction in postoperative when neurological deterioration occurs, particularly in patients with thyroid disease. Myxedema coma is rare and presents insidiously, mimicking drug

overdose or worsening neurological states. Its diagnosis requires a higher degree of suspicion. Timely intervention and endocrinological collaboration are essential to reduce morbidity and mortality.

References:

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- 2. Yafit D et al. Postoperative myxedema coma in patients undergoing major surgery: Case series. Auris Nasus Larynx. 2019 Aug;46(4):605-608.

Learning points: Myxedema coma should be considered in the differential diagnosis of postoperative altered mental status, particularly in patients with pre-existing thyroid dysfunction. Drug related effects and neurological causes may hide and delay the diagnosis. Early endocrinological intervention with thyroid hormone replacement is critical for a favorable outcome.

10AP07-1 Continuous monitoring after PACU discharge – Does it have a role? A case report

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Background: Currently, monitoring of patients in general wards is predominantly carried out intermittently, which can lead to late identification of signs of clinical deterioration. In this context, the Early Warning Score (EWS) was developed as a tool to assist in the early detection of complications, but its effectiveness is limited by the frequency of assessments, allowing the possibility of significant clinical changes going unnoticed between monitoring intervals. Continuous monitoring (CM) in the ward appears as a promising solution.

We report the case of a 68-year-old patient who underwent femoral endarterectomy (FE), whose clinical evolution was marked by early identification and effective management of an episode of acute pulmonary edema (APE).

Case Report: A 68-year-old patient who underwent FE was transferred to the surgical ward on the second postoperative day. Her stay in the PACU was uneventful. Upon arrival, she was continuously monitored with the Isansys LifeTouch device as part of a pilot project of CM in this ward (Figure 1).

An EWS of 13 prompted an assessment by the nursing staff. Signs of clinical deterioration were identified, including desaturation, tachycardia and hypertension, leading to the activation of the medical team, who identified APE. Management included stabilization measures and PACU readmission, given that non-invasive ventilation was not possible in the ward. Progressive clinical improvement was attained. She was discharged without further complications.

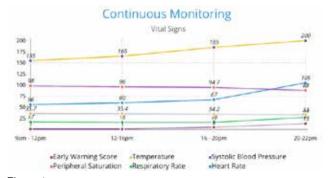


Figure 1.

Discussion: Postoperative mortality surpasses intraoperative mortality, emphasizing the need for robust monitoring tools. In this case, CM proved invaluable, enabling early detection and treatment of APE, which may have been delayed with an intermittent method. It also allowed real-time assessment of treatment efficacy while the patient awaited PACU vacancy, enhancing overall quality of care.

References:

BJA.2019;122(3):304e306. BJA.2024;132(3):519e527. Acta Anaesthesiol Scand. 2023 Jan;67(1):19-28.

Learning points: CM is advantageous in surgical inpatients as it can timely detect clinical deterioration, enhancing clinical outcomes and ensuring safety.

10AP07-2

Factors affecting postoperative nausea and vomiting in interventional radiology anesthesia: a prospective observational study

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Background and Goal of Study: Interventional radiology procedures, often performed under sedation, offer advantages such as reduced risk, pain, and recovery time compared to traditional surgery. Postoperative nausea and vomiting (PONV) are common and distressing side effects of anesthesia, affecting up to 30% of patients.^{1,2}

This study aims to investigate the risk factors associated with PONV in procedures under sedation during interventional radiology anesthesia.

Materials and Methods: After obtaining ethical approval, this study was conducted at Hacettepe University Hospital between January and August 2023. A total of 213 patients undergoing interventional radiology procedures under sedation were included to evaluate PONV incidence and associated factors. Demographic characteristics, medical history, anesthetic agents used, and peroperative monitoring data were collected. Nausea and vomiting were assessed using the Abramowitz emetic scoring scale at postoperative period.

Results and Discussion: Nausea occurred in 12.2% of patients, while vomiting occurred in 1.9%. All anesthetic agents increased the risk of PONV, but no significant relationship was found between the type of anesthetic, interventional procedure, and nausea/vomiting occurrence.

However, the combination of anesthetic drugs appeared to influence nausea incidence, with higher rates in patients receiving multiple agents.

Conclusion(s): A history of PONV was a significant risk factor for developing nausea during sedation anesthesia. Patients with a history of PONV were 12.4 times more likely to experience nausea ³

These findings highlight the importance of assessing patients' previous nausea and vomiting history to identify high-risk individuals and mitigate these risks. Further research is needed to optimize anesthesia management in interventional radiology settings.

References:

PMID: 22562482
 PMID: 24491648
 PMID: 36550611

Acknowledgements: Clinical Significance: The findings of this study underscore the importance of considering patients' history of postoperative nausea and vomiting (PONV) when administering sedation anesthesia for interventional radiology procedures. Identifying patients at higher risk for PONV can help healthcare providers implement appropriate preventive measures, potentially improving patient outcomes and satisfaction. Further research is warranted to refine anesthesia management strategies and minimize PONV in this setting.

10AP07-3

Seizures following cardiac surgery: A retrospective case series and literature review

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Background: Postoperative seizures are a recognized but uncommon complication of cardiac surgery, with potential implications for patient recovery and long-term outcomes. Understanding their etiology and risk factors is crucial for optimising perioperative care

Our objective is to analyze the incidence, characteristics, and potential contributing factors of postoperative seizures in patients undergoing cardiac surgery at our institution, complemented by a comprehensive literature review.

Case Report: We conducted a retrospective review of 25 cases of postoperative seizures in cardiac surgery patients treated at Alicante General Hospital between June 2018 and November 2024. Data collected included patient demographics, comorbidities, type of surgery, perioperative medications, and seizure characteristics. A literature review was performed to contextualize our findings within the broader evidence base.

Discussion: The incidence of postoperative seizures in cardiac surgery patients ranged from 0.8% to 1.6% at our institution. The most commonly associated procedures were valve replacements and coronary artery bypass grafting.

The majority of seizures were linked to perioperative complications, particularly left ventricular failure and atrial fibrillation. Most cases were successfully resolved with antiepileptic treatment, primarily using midazolam and levetiracetam.

References:

Manji RA, et al. "Neurological Complications After Cardiac Surgery." Journal of Cardiothoracic and Vascular Anesthesia 2021

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Learning points: The analysis of our case series, combined with existing literature, provides valuable insights into the potential predictors and management strategies for postoperative seizures in cardiac surgery patients. This work highlights the need for heightened perioperative vigilance and further research into preventive measures.

10AP07-4

Preoperative patient education significantly improves anxiety management and recovery after colon surgery

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Background and Goal of Study: Patient education is one of the methods to control preoperative anxiety, postoperative pain, and improve recovery after the surgery. Our study investigates the effects preoperative patient education has on preoperative anxiety level and postoperative recovery, well-being, and satisfaction with provided healthcare

Materials and Methods: patients undergoing elective colon surgery were included in the study and randomly assigned to either intervention (education) or control group. Intervention group attended preoperative education course 10-14 days before the surgery.

Preoperative anxiety was assessed using APAIS score, QoR-40 and HCAPS scores were used to evaluate postoperative recovery and satisfaction. Mean values were compared between the groups using independent sample t-test. Clinical trial registration No. NCT05208580 (ClinicalTrials.gov).

Results and Discussion: 62 patients were included (38 in intervention group and 24 controls). Groups did not differ based on age, sex, education, preoperative risk or duration of surgery. Intervention group had lower APAIS anxiety scores (17.9 vs. 22.2, p=0.007). Reduced perioperative stress response positively affects postoperative recovery and could explain our findings that patients who underwent preoperative classes had better well-being score on the first postoperative day (7.2 vs. 6.4, p=0.001), were able to get up from the bed on the first postoperative day more often (36.8 vs. 12.5%, p=0.044), and had shorter duration of hospitalization (9.6 vs. 14.1 days, p=0.037). This translates into better recovery and satisfaction with provided healthcare: intervention group had better HCAPS (71.7 vs. 67.0, p=0.005) and QoR-40 scores (172.6 vs. 157.6, p<0.001).

No difference was found in postoperative pain on the first 3 days after the surgery, drowsiness or nausea and vomiting. This could be explained by the use of standard perioperative pain and postoperative nausea and vomiting prophylaxis for colon surgery in our hospital.

Conclusion(s): Preoperative patient education reduces preoperative anxiety. Informing patients before the surgery not only statistically, but also clinically improves postoperative recovery, satisfaction, and well-being of the patients after colon surgery.

10AP07-5

Epidemiology of lung ultrasound scores and venous excess ultrasound grades in the first 5 days after major gastrointestinal surgery

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Background and Goal of Study: Complications occur frequently after major gastrointestinal surgery and are associated with significant morbidity. Point of care ultrasound, e.g. lung ultrasound score (LUS) and the venous excess ultrasound score (VExUS) are readily available at the bedside and have been associated with adverse outcomes in patients after orthopaedic and cardiac surgery. However, little is known about the feasibility and range of these scores before and after major gastrointestinal surgery. Materials and Methods: This is a preliminary analysis of an ongoing observational study investigating post-operative complications.

Inclusion criteria: ≥18 years, and major gastrointestinal surgery. Exclusion criteria: major cardiac shunts, dialysis, expected unfeasible POCUS e.g. BMI>40.

Patients underwent LUS and VExUS before and 5 days after surgery for a total of 6 measurements. The study was approved by the local IRB and informed consent was obtained.

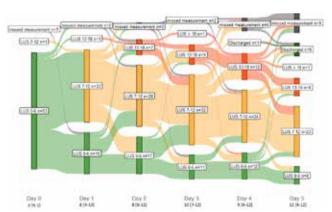


Figure 1.

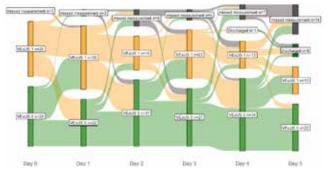


Figure 2.

Results and Discussion: Of the 55 patients included 11(20%) patients underwent liver resection, 26(47%) underwent pancreas resection, and 18(33%) underwent esophagectomy. Median age

was 71[61-76], median BMI was 24.5[21.6-27.1]. Median length of stay was 7[6-13] days and no patients died in the 30 days after surgery. Out of 330 assessments, 23(7%) LUS and 38(12%) VEx-US were missing. The most common reason for this was patient refusal (99%).

Figure 1 represents LUS scores over the first 5 days; showing an upward trend during the first 3 days.

Figure 2 represents VExUS grades, with little change throughout the first 5 days.

Conclusion: LUS and VExUS are feasible after major gastrointestinal surgery. LUS tends to increase after surgery while VExUS remains stable. This suggests that daily VExUS might not be very informative in this population. However, associations with relevant outcomes need to be further investigated.

10AP07-6

Evaluation of proenkephalin A 119-159 with biomarker panel (SEMA3A, RBP-4, KIM-1) following complex endovascular aneurysm repair: a prospective, observational study

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Background and Goal of Study: Serum creatinine (SCr) has served as the gold standard for monitoring kidney function, including acute kidney injury (AKI) for 90 years, yet its limitations in perioperative settings necessitate the exploration of more sensitive biomarkers.

This study aimed to evaluate the utility of Proenkephalin A 119-159 (penKid) as an early biomarker for AKI after complex endovascular aneurysm repair (EVAR), comparing it with six other biomarkers: Semaphorin-3A (SEMA3A), Retinol Binding Protein-4 (RBP-4), Kidney Injury Molecule-1 (KIM-1), Netrin-1, Tissue Inhibitor of Metalloproteinase-2 (TIMP-2), and Insulin-like Growth Factor-Binding Protein-7 (IGFBP-7).

Materials and Methods: This single-centre, prospective, observational study was conducted between April 2022 and June 2024 at the Central Teaching Hospital, Medical University of Warsaw, Poland. 66 patients were included in the analysis. The samples were collected before EVAR and up to 24h, 48h, and 72h after. Using the ELISA method, the biomarker concentrations were measured perioperatively from the blood (RBP-4, SEMA3A) and urine (SEMA3A, RBP-4, KIM-1, netrin-1, TIMP-2, IGFBP-7) in 30 pts. penKid was measured using a bedside blood test with IB10 sphingotest® penKid® assay in 66 pts. AKI was diagnosed according to the KDIGO[1] SCr criteria.

Results and Discussion: Preexisting chronic kidney disease, particularly stages 3b and 4, was identified as a significant risk factor for postoperative AKI. The penKid demonstrated high accuracy (0.73), sensitivity (0.78), and specificity (0.71) with an AUC of 0.76 at a cut-point of ≥2.29 ng/mL. SEMA3A in serum showed exceptional performance with an AUC of 0.88 and high specificity (0.92) at ≥89.10 pg/mL. A biomarker panel combining penKid, SEMA3A, and KIM-1 achieved the highest discriminative perfor-

mance (AUC 0.89, 95% CI: 0.77-1.00). An alternative panel replacing SEMA3A with RBP-4 showed comparable performance (AUC 0.81, 95% CI: 0.65-0.99).

Conclusion(s): This study demonstrates that penKid is a reliable early biomarker for AKI detection after EVAR procedures. Combining penKid with either SEMA3A or RBP-4, plus KIM-1, provides robust diagnostic performance for early AKI detection.

Acknowledgements: The study was partially funded by the National Science Centre, Poland [2020/39/O/NZ5/02171]. Sphingo-Tec GmbH provided IB10 free of charge.

Reference:

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10AP07-7

Optic nerve sheath diameter in head-down pneumoperitoneum surgery and delirium

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Background and Goal of Study: Surgeries in head-down, trendelenburg positions with pneumoperitoneum are common, and have been associated with increases in intracranial pressure (ICP). This rise in intracranial pressure has been assessed noninvasively via ultrasonographic assessment of optic nerve sheath diameter (ONSD). However, the effects of elevated ONSD on postoperative outcomes, specifically postoperative delirium, has not been assessed.

Materials and Methods: We included adult patients >18 years old undergoing non-neurological surgery requiring head down positioning with pneumoperitoneum. IRB approval was given (Ref: 2022/00064) and written informed consent was sought. Exclusion criteria were patients with pre-existing delirium, pre-existing ophthalmic diseases precluding ONSD assessment, or inadequate head down <15 degrees.

Primary outcome was presence of postoperative delirium in the postanaesthetic care unit (PACU) and on postoperative day 1 (POD1), as determined by NuDESC and 3D-CAM. Secondary outcomes were time to extubation, PACU stay, postoperative nausea/vomiting and postoperative headache.

Results and Discussion: A total 16 patients were recruited between Oct-23 to Jun-24. 2 patients were excluded due to inadequate head down positioning. 2 patients (14.28%) had post-operative delirium in PACU. ONSD increased significantly from baseline to end of procedure (4.62 vs 5.40. Mean difference 0.78, p<0.001). ONSD was significantly larger in patients with delirium (6.35 vs 5.24mm, mean difference -1.11, p=0.02). Patients with elevated ICP by ONSD more often had postoperative delirium in PACU (40% vs 0%), however this was not significant (p=0.110). No patient had delirium on POD1. Time to extubation and PACU stay were similar between groups. No patients had headache or nausea in the PACU.

Conclusion(s): Surgeries in head-down, trendelenburg positions with pneumoperitoneum are associated with a rise in ICP. This may be associated with postoperative delirium in the PACU. It remains to be determined if raised intracranial pressures noted from ONSD assessment should be treated.

10AP07-8

The predictive value of the Surgical Apgar Score compared to established tools for postoperative complications in vascular surgery: A retrospective ROC and multivariate regression analysis

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Background and Goal of Study: Postoperative risk stratification in vascular surgery is vital for improving patient outcomes. The Surgical Apgar Score (SAS), developed to assess intraoperative risks, was evaluated against established risk tools (RCRI, SORT, CCI) for predicting mortality and major complications.

The study aimed to determine the predictive accuracy of SAS and its integration into perioperative protocols.

Materials and Methods: We conducted a retrospective analysis of 119 patients (aged 18-75) who underwent vascular surgeries (femoral-bypass with synthetic grafts) between 2010 and 2023. The study protocol was approved by research ethics committee of the Nicolae Testemitanu State University of Medicine and Pharmacy, Republic of Moldova. We analyzed SAS components alongside demographic and clinical data using regression models to predict postoperative outcomes.

Complications such as mortality, renal insufficiency, graft failure, unplanned intubation, pneumonia/embolism, and bleeding/transfusion were assessed. ROC analysis quantified predictive accuracy (AUC), while multivariate regression identified significant predictors, including SAS, age, and clinical interventions.

Results and Discussion: ROC analysis showed SAS as a strong predictor for mortality (AUC = 0.9186, p < 0.0001) and septic shock/acute myocardial infarction (AUC = 0.9497, p = 0.008), with significant odds reduction per SAS point for mortality (OR = 0.278, p = 0.0217) and unplanned intubation (OR = 0.426, p = 0.0152).

Multivariate regression highlighted vasopressor use (OR = 81.9, p = 0.0102) and angina (OR = 18.62, p = 0.0508) as additional predictors for mortality, while SAS reduced odds for bleeding/transfusion (OR = 0.419, p = 0.0342) and pneumonia/embolism (OR = 0.571, p = 0.0233). SAS was less predictive for graft failure (p = 0.0578) and renal insufficiency (p = 0.2929).

Conclusion(s): The Surgical Apgar Score demonstrated comparable or superior predictive accuracy for certain complications compared to traditional tools, particularly for mortality and unplanned intubation. Integrating SAS into vascular surgery protocols could enhance real-time risk stratification and postoperative management.

Further studies should evaluate its broader applicability and combination with other tools.

10AP07-10

Lactic acidosis in major abdominal surgery: role of the alteration of monocarboxylate transporters

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Background and Goal of Study: Lactate transport across membranes occurs through monocarboxylate transporters (MCTs), encoded by the SLC16gene family. It has been shown that MCT1 polymorphism (rs1049434) T1470Ais associated with defect in lactate transmembrane transport: T-allele is correlated with about 50% reduction in lactate transport rate compared to the A-allele¹. The aim of this study is to clarify the relation between lactate transporter polymorphism and lactate clearance in patients undergoing major elective abdominal surgery.

Materials and Methods:patients undergoing major elective abdominal surgery were enrolled. Intraoperative monitoring and anaesthesia protocol were the ones routinely used in our Unit. Together with first blood sample taken for blood gas analysis, an additional 3mL of blood was drawn for the genetic analysis of the MCT1-polymorphism. After genetic sequencing, population was divided into two groups: group with the T-allele in homozygous and heterozygous forms, and group with the A-allele in homozygous form.

Results and Discussion: Between 2/2024 and 5/2024, 109 patients were enrolled. After genetic categorization, population was divided into 2 groups: 66 patients carrying the T-allele in homozygous and heterozygous forms, and 43 patients with the A-allele only in homozygous form.

A significantly higher number of patients exhibited hyperlactatemia (blood lactate ≥2.2mmol/L) at T3 in the TT/TA group (p=0.02). Two-way ANOVA showed that time had an impact on lactate during the perioperative period in both groups (p<0.001). TT/TA group showed a higher number of total complications (39.4% vs 11.6%, p=0.002) and severe (24.2% vs 4.6%, p=0.007) compared to the AA group (Table 1).

	TT group (n=66)	AA group (n=43)	t o chisquare	р
Lactate ≥ 2.2 (mmol/L) a T3 n,(%)	53 (80.3)	26 (60.5)	5.14	0.02
Total complication, n (%)	26 (39.4)	5 (11.6)	9.86	0.002
Severe complication (C-D≥3a), n (%)	16 (24.2)	2 (4.6)	7.25	0.007

Table 1. Intra- and post-operative variables.

Conclusion(s): This study demonstrates that A140T-polymorphism of MCT1-lactate transporter is associated not only with a higher incidence of hyperlactatemia 3 hours after major elective abdominal surgery but also, with a higher incidence of complications and severe complications. Further studies are necessary to clarify its impact on postoperative outcomes.

10AP07-12

Tailored perioperative care in a young patient with functional paraganglioma after a severe hypertensive crisis

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Background: paragangliomas (PG) are rare neuroendocrine tumors arising from extra-adrenal paraganglia¹. Functional sympathetic PGs secrete catecholamines² and pose significant challenges due to a severe hemodynamic instability risk, throughout the entire perioperative period.

Case Report: a 27-year-old male with double functional sympathetic abdominal PG was deemed surgery-ready after protocolled preoperative optimization. During anesthesia induction he experienced a severe hypertensive crisis (systolic BP 300 mmHg), resulting in surgical postponement.

After stabilization, as he maintained refractory hypertension, a multidisciplinary team was assembled to optimize perioperative care. Optimal hemodynamic control was achieved with maximum daily doses of phenoxybenzamine, carvedilol and amlodipine, with alprazolam.

The patient was identified as being at exceptionally high risk for hemodynamic instability, especially for post-resection hypotension due to the dense pharmacological blockade. A tailored plan incorporated short-acting agents such as urapidil and vasopressin, unavailable at the institution, that were sourced for the rescheduled surgery.

The patient underwent open resection under total intravenous anesthesia. Hypertension during tumor manipulation was managed with esmolol, magnesium sulfate, and phentolamine. Post-resection hypotension required norepinephrine, adrenaline, vaso-pressin, and guided transfusion.

On postoperative day one, he was successfully weaned off vasopressors and later discharged without complications.

Discussion: This case highlights the challenges of managing functional and unpredictable PGs, where refractory hypertension limits standard pharmacological strategies.

Success was achieved through multidisciplinary collaboration, procurement of cardiovascular drugs, and a patient-specific perioperative plan, demonstrating the critical role of anesthesiologists in high-risk cases and resulting in improved patient outcomes.

References:

1. doi.org/10.1007/s12022-022-09704-6.

2. doi.org/10.6004/jnccn.2021.0032

Learning points: Functional PGs are unpredictable despite preoperative optimization. Effective management requires meticulous planning, adaptability, and multidisciplinary teamwork. Successful PG management requires adherence to protocols while adapting strategies to individual needs.

Anesthesiologists play a pivotal role in multidisciplinary teams, ensuring patient safety through resourceful and system-independent solutions.

10AP08-1

Prevalence and management of preoperative anemia and its outcomes in gastrointestinal cancer patients: preliminary results

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Background and Goal of Study: Preoperative anemia affects approximately 30% of patients undergoing major surgery and is associated with increased morbidity and transfusion rates. Patient Blood Management (PBM) protocols aim to optimize hemoglobin (Hb) levels preoperatively. However, the efficacy of intravenous (IV) iron supplementation in reducing allogeneic blood transfusion (ABT) and postoperative complications remains uncertain.

This study evaluates whether IV iron supplementation in anemic patients prior to gastrointestinal oncologic surgery improves Hb levels, reduces ABT rates, and mitigates postoperative complications.

Materials and Methods: This prospective observational study included adult patients undergoing gastrointestinal oncologic surgery. Anemic patients (Hb <13 g/dL) received IV iron supplementation during their pre-anesthesia (PACE) visit.

The primary outcome was the change in Hb from the PACE visit to the day before surgery.

Secondary outcomes included ABT rates, postoperative complications (Clavien-Dindo classification), and length of stay (LOS). Outcomes were compared between anemic and non-anemic patients using unpaired non-parametric tests.

Results and Discussion: The analysis included 20 patients (mean age 68 \pm 14 years; 11 females, 9 males). Anemic patients (n=9) showed a significant Hb increase (1.0 \pm 1.1 g/dL) compared to a decrease in non-anemic patients (n=8) (-0.4 \pm 1.4 g/dL, p<0.05). The mean interval between IV iron administration and surgery was shorter than anticipated (10 \pm 5 days). There were no differences in ABT rates (0% vs 0%), postoperative complications (0% vs 18%), or LOS.

	Anemic patients (n=9)	Non anemic patients (n=11)	p-value
Age, y.o.	71±15	64 ± 13	0.147
Sex, male / female, n (%)	3 (33) / 6 (67)	6 (54)/5 (45)	0.406
ASA III-IV, n (%)	4 (45)	2 (22)	0.336
Colorectal / Gastroesophageal, n (%)	8 (73) / 3 (27)	11 (100) / 0 (0)	0.214
Preanesthesia Hb, g/dl	10.3 ± 1.8	14.1 ± 1.0	
Before surgery Hb, g/dl	11.5 ± 1.62	13.6 ± 1.8	
Length of stay, days	4.7 ± 3.6	3.64 ± 2.1	0.889

Table 1: Demographic and clinical characteristics.

Conclusion(s): IV iron supplementation before oncologic gastrointestinal surgery was associated with improved Hb levels in anemic patients. However, preliminary data were insufficient to draw conclusions regarding ABT rates or postoperative complications. The findings highlight the challenges of optimizing Hb levels in patients with active inflammation and active bleeding.

10AP08-2

Changes in arterial-venous pressure of CO₂ (ΔPCO₂) and arterial-venous pressure of O₂ (Ca-vO₂) as predictive factors of postsurgical complications

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Background and Goal of Study: O_2 consumption (VO_2) depends on the cardiac output (CO) and the arterial-venous difference in the concentration of O_2 (Ca- vO_2) in the blood. CO correlates with the level of tissue perfusion and, according to the Fick formula, it is indirectly proportional to the veno-arterial difference in PCO_2 (ΔPCO_2). ΔPCO_2 >6 mmHg is considered as an index of inadequate tissue perfusion, and $Ca-vO_2$ - a marker of tissue hypoxia.

The goal of study was to evaluate the changes in ΔPCO_2 and $Ca-vO_2$ as predictive factors in the risk of developing postoperative complications.

Materials and Methods: In this prospective study ΔPCO_2 and $CavO_2$ were assessed in 42 patients undergoing non-cardiac surgery. Evaluation was performed in the early postoperative period, and the variations of laboratory tests was assessed pre- and 24 hours postoperatively.

The statistical analysis was performed with the statistical program Graph Prism 8.0, using the Fisher exact test. Relative risk (RR), test specificity (Sp), test sensitivity (Sn) were calculated. The results are presented as mean with a confidence interval of 95% (Cl95%).

Results and Discussion: A statistically significant correlation was observed between ΔPCO2, Ca-vO₂ and the risk of developing postoperative complications. Fisher exact test for liver dysfunction correlated with ΔPCO_a; RR - 1.33 (95% CI 0.8 - 2.1), with Sn - 0.57 (95% CI 0.42 - 0.70), Sp - 0.57 (95% CI 0.42 - 0.70); correlated with Ca-vO₂: RR - 1.6 (95%CI 1.0 - 2.5), Sn - 0.64 (95%CI 0.49 - 077) and Sp - 0.57 (95%Cl 0.42 - 0.70). Fisher's exact test for pancreatic dysfunction correlated with ΔPCO_a: RR - 2.1 (95%CI 1.35 - 3.2), Sn - 0.57 (95%CI 0.42 - 0.70) and Sp - 0.78 (95%CI 0.64 - 0.88); correlated with Ca-vO₂: RR - 2.4 (95%CI 1.55 -3.9), Sn - 0.64 (0.49 - 0.77), Sp - 0.78 (0.64 - 0.88). Fisher exact test for postoperative systemic inflammatory response syndrome (SIRS) correlated with ΔPCO₂: RR - 1.7 (95%CI – 1.60 – 2.77), Sn -0.57 (95%Cl 0.42 - 0.70), Sp - 0.71 (0.56 - 0.83); correlated with Ca-vO₂: RR - 2.07 (95%CI 1.33 - 3.36), Sn- 0.64 (5%CI 0.77 - 0.99) and Sp - 0.71 (5%CI 0.56 - 0.82).

Conclusion(s): ΔPCO_2 and $Ca-vO_2$ values statistically significantly correlates with the risk of developing postoperative complications (liver dysfunction, pancreatic dysfunction and SIRS). ΔPCO_2 , $Ca-vO_2$ may be the key goals of hemodynamic resuscitation in the patient undergoing surgery to prevent complications.

10AP08-3

Complex hernia repair with the Fasciotens® system under combined anesthesia

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Background: The Fasciotens® Hernia system is a novel instrument for complex hernia surgical treatment. The anaesthetic management of these patients must account for alterations in ventilatory mechanics due to the procedure. This report details the perioperative management of a patient submitted to hernia correction with the Fasciotens® Hernia system.

Case Report: A 73-year-old male, ASA III, was scheduled for correction of a midline incisional hernia, with 16cm opening diameter and volume of 2725mL. Workup revealed a Low Anterior Resection and two hernioplasties. The patient was admitted 14 days prior for respiratory prehabilitation, abdominal wall injection of botulinum toxin and to create an 8.8 L pneumoperitoneum for tissue expansion.

Supplemental O2 (Nasal Cannula, 1L/min) was required on day 13, without other events. A Combined Anaesthesia was chosen. A cephalically-oriented epidural catheter was inserted at the T11-T12 level, followed by rapid sequence intubation with Propofol 2mg/kg, Fentanyl 2µg/kg and Rocuronium 1.2mg/kg.

The maintenance agent was Sevoflurane. Fractioned boluses of Ropivacaine 2mg/mL (total 24mg) were administered throughout. Analgesia included Ketamine 20mg, Paracetamol 1g, Tramadol 100mg and 1mg Epidural Morphine. A weight of 14kg was distributed over the abdominal wall. Ventilatory pressures were measured, with a final peak pressure of 17cmH₂O.

The surgery ended in four hours without adverse events. The PACU stay was uneventful and the patient was transferred to an intermediate-care unit. Postoperative analgesia included Paracetamol 1g 3x/d, Tramadol 100mg 3x/d, Epidural Ropivacaine 2mg/mL (20mg) 4x/d and Epidural Morphine 1.5mg 2x/d if required.

A switch from Ropivacaine to fixed Epidural Morphine 2.5mg 2x/d was conducted on day 2 due to hypotension.

Resting and movement pain were zero on the NPRS. Rehabilitation progressed adequately. The catheter was removed on day 3 and the patient was discharged on day 6.

Discussion: Repair of large hernias can alter a patient's ventilatory mechanics, making vigilance of airway and abdominal pressures during surgery mandatory. Postoperative pain can compromise the patient's respiratory function and rehabilitation, making locoregional techniques beneficial.

Learning points: The Fasciotens® system can aid surgeons in correcting large hernias. The anaesthesiologist must be familiar with these tools in order to better adapt the perioperative anaesthetic plan for each patient.

10AP08-4

Reporting of patients' satisfaction following general anaesthesia in a tertiary hospital of Greece

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Background and Goal of Study: Patient satisfaction is considered to be an important quality index in health care services. Goal of this study was to assess surgical patient satisfaction following general anaesthesia and clarify contributing factors of anaesthetic services.

Materials and Methods: After ethical committee approval and written consent, 60 adult patients received a standardised questionnaire after recovering from general anaesthesia for elective surgery. It was distributed a few hours postoperatively. Patients filled out the questionnaire on their own, while in the ward, and documents were collected the day after.

Eighteen questions were included, regarding three dimensions:

- 1. Preoperative communication with anaesthesiologist and level of involvement in decision making,
- 2. Possibility of awareness, sense of cold-shivering, pain levels, nausea-vomiting,
- 3. Anxiety, sense of safety (post-extubation and in PACU).

Two questions involved possible self-reporting adverse effects and dissatisfaction points.

Results and Discussion: As to dimension (1), 88,14% of responders mentioned that had time to address questions to anaesthesiologist and 84,75% were involved in decision making regarding type of anaesthesia preferred.

Regarding dimension (2), no patient reported awareness, 87% did not experience shivering, 81,36% felt least or no cold, 79,66% felt least or no pain after emergence, 86,44% did not feel nausea, and 98,31% did not vomit.

As for dimension (3), all responders agreed that anaesthesiologists did their best to take care of them, 96,61% reported feeling safe and 89,83% had no anxiety during their stay in PACU.

Overall, 98,31% of responders defined their experience with anaesthesia as being good to excellent. Reported dissatisfaction points were extreme noise and intense lighting in the operating room. One patient expressed dissatisfaction about delayed commencement of operation.

Conclusion: High satisfaction levels were reported among surgical patients in relation to anaesthesia services in a tertiary hospital of Greece. The main determinants of patient satisfaction are: interaction between patients and anaesthesiologists, patient involvement in decision making, effective pain management, avoidance of undesired effects and feeling of safety.

Anaesthesiologist's best effort correlated with high satisfaction levels reported in the present study. A greater number of patients should be included in order to reinforce aforementioned results.

10AP08-5

The impact of different doses of intravenous magnesium sulfate on postoperative shivering occurrence in elderly patients undergoing elective lower abdominal surgery under spinal anaesthesia

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Background and Goal of Study: Shivering, a common complication following spinal anaesthesia, triggers potentially dangerous hemodynamic events, particularly in elderly. Our prospective randomized double-blind placebo-controlled clinical trial was designed to compare in terms of efficacy and safety the influence of two different doses of magnesium sulfate, a promising anti-shivering agent, on incidence of postoperative shivering in elderly undergoing elective lower abdominal surgery under spinal anaesthesia.

Materials and Methods: 60 patients (aged ≥65 years) scheduled for lower abdominal surgery under spinal anaesthesia were randomly assigned to one of the following groups: group A (n=20 patients) and group B (n=21 patients) that were given 80mg/kg and respectively 50mg/kg of magnesium sulfate, intravenously administered over 30 minutes after spinal anaesthesia and group C (n=19 patients) that received placebo according to the same protocol. Both the incidence and degree of shivering (Crossley Mahajan scale) were assessed during the first 2h postoperatively as primary outcomes.

Secondary outcomes targeted were the incidence of hypotension, bradycardia, oxygen desaturation and hypothermia recorded during the same interval. Data were analysed using Mann Whitney and Fisher's exact test, statistical significance being considered for p<0.05.

Results and Discussion:Concerning the incidence of shivering, we found similar values in groups A and B (p>0.05), which were statistically lower by comparison to group C (p<0,01). Significantly more patients experienced high-grade shivering in placebo versus magnesium sulfate groups (p<0.02), the latter being comparable in this respect, as well (p>0.05).

Hypotension, even mild and transient, was recorded with a significantly higher incidence in group A in contrast to groups B and C (p<0,05) that showed no difference. No episodes of desaturation, bradycardia or hypothermia were documented among groups during study period.

Conclusion(s): According to our findings, magnesium sulfate provided a substantial protection against shivering during first 2h after lower abdominal procedures under spinal anaesthesia in elderly. Between the two studied regimens, the dose of 50mg/kg seems to be optimal since it emphasizes similar efficacy in terms of occurrence and degree of shivering, while ensuring a statistical superior hemodynamic stability compared to 80mg/kg.

10AP08-7

Acute kidney injury in complex endovascular aneurysm repair: Exploring non-coding RNA and sirtuin pathways, in silico and validation analysis

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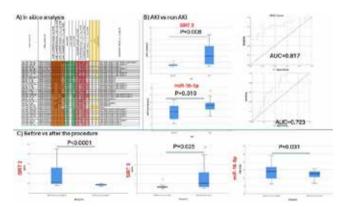
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Background and Goal of Study: Acute kidney injury (AKI) remains a significant complication in perioperative settings, with incidence rates up to 50%. Despite current preventive measures, AKI continues to pose a significant healthcare challenge. This study investigated the role of microRNAs (miRNAs) and

This study investigated the role of microRNAs (miRNAs) and sirtuins (SIRTs) in AKI following endovascular aneurysm repair (EVAR).

Materials and Methods: We conducted a cross-sectional observational study from April 2022 to October 2024, enrolling 29 adult patients undergoing elective EVAR. Blood samples were collected pre-procedure and up to 24 hours post-procedure. AKI was diagnosed using SCr KDIGO (2012) criteria.

We performed bioinformatic analyses, including miRNA prediction, using a multimiR package. Gene lists were compiled from Malacards and DisgeNet databases, with additional SIRTs genes.



Results and Discussion: Through in silico analysis using bioinformatic tools, we identified the top 20 miRNAs associated with AKI in both AKI and the regulation of SIRTs.

We analyzed the expression levels of SIRT1–6 genes alongside miRNAs, including let-7b-5p, miR-124-3p, miR-155-5p, miR-16-5p, miR-182-5p, miR-34a-5p, miR-34b-5p, and miR-590-3p. Notably, SIRT2 and miR-16-5p expressions were significantly decreased, while SIRT3 expression was significantly increased post-procedure (p< 0.0001, p=0.025, p=0.031, respectively).

Baseline expression levels of SIRT2 and miR-16-5p were also significantly higher in patients with AKI than those without AKI (p=0.008, p=0.010, respectively). Receiver operating character-

istic (ROC) curve analysis highlighted the diagnostic potential of SIRT2 and miR-16-5p, with area under the curve (AUC) values of 0.817 and 0.723, respectively.

Conclusions(s): This study evaluates the RNA regulatory networks implicated in post-EVAR AKI. The identified molecular markers, particularly baseline SIRT2 and miR-16-5p, demonstrate diagnostic biomarker potential.

Acknowledgements: This research was funded by the National Science Centre, Poland [2020/39/O/NZ5/02171].

10AP08-8

Implementation of the ERAS protocol in hip arthroplasty: Reducing length of stay and improving recovery

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Background and goal of study: The Enhanced Recovery After Surgery (ERAS) protocol is revolutionizing the approach to hip surgeries, promoting faster and more efficient recovery. With integrated practices from preoperative preparation to postoperative care, ERAS aims to reduce surgical stress and minimize complications. Strategies such as optimizing nutrition, effective pain management, early mobilization, and reducing opioid use are key components. These practices not only improve the patient experience and accelerate recovery but also reduce hospital stay duration, allowing for a quicker return to daily activities.

Methods: This prospective interventional study evaluated the implementation of the ERAS protocol in total hip arthroplasties at a private hospital in São Paulo. The approach was multidisciplinary and covered all perioperative stages. A total of 211 patients were included in the program, which started in October 2021, with data analysis extending until early 2024. The study is still ongoing.

Results: The ERAS protocol was applied to 211 patients, of whom 55% received spinal anesthesia with sedation and 45% underwent general anesthesia with regional block. Both techniques followed the "opioid-less" concept, aiming to minimize complications associated with opioid use. The protocol included reducing preoperative fasting, with maltodextrin supplementation two hours before surgery to attenuate the inflammatory response. Early ambulation was encouraged in the postoperative period.

As a result of these interventions, 80% of patients were transferred to the post-anesthesia care unit (PACU), while 20% were transferred to the intensive care unit (ICU). Prior to the implementation of ERAS, these numbers were 52.6% and 47.4%, respectively. The most significant change was the reduction in the average length of stay, which decreased from 11.4 days to 1.7 days.

Conclusion: The implementation of the ERAS protocol for total hip arthroplasties at the private hospital in São Paulo resulted in significant improvements in postoperative recovery. The study demonstrated a substantial reduction in hospital stay length and a greater proportion of patients being directed to the PACU. These improvements are attributed to strategies such as the use of "opioid-spare" anesthesia, reduced preoperative fasting, and promotion of early mobilization. The continuation of the study is essential to refine clinical practices and provide even more effective recovery for patients.

10AP08-9

More data for guideline: GLP-1 agonists and perioperative respiratory complications

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Background: Glucagon-like-peptide (GLP)-1-agonists are antidiabetic drugs that have become frequently used for their strong effects on weight loss and cardio protection. An important side effect in the peri-procedural setting is delayed gastric emptying, raising concerns about regurgitation and pulmonary aspiration [1,2]. Recent ASA guidelines recommend preoperative cessation of these drugs with limited supporting data [2]. We investigated the association between GLP-1-agonist-use and perioperative respiratory complications (PRC).

Patient characteristics	No GLP-1 agonist use N=327,064	GLP-1 agonist use N=6,176	Absolute std. diff.
DEMOGRAPHICS			
Age	60 (48 - 70)	62 (54 - 69)	0.183
Sex, female	176,203 (53.9%)	3,356 (54.3%)	0.009
Federal insurance	148,737 (45.5%)	2,733 (44.3%)	0.025
PREOPERATIVE CHARACTERISTICS			
Elixhauser score	5 (0 - 15)	8 (0 - 17)	0.127
BMI, kg/m2	27.2 (23.7 - 31.6)	33.2 (29.0 - 38.7)	0.868
ASA physical status classification	2 (2 - 3)	3 (2 - 3)	0.575
History of:			
Diabetes	78,298 (23.9%)	5,304 (85.9%)	1.590
Tobacco abuse	110,889 (33.9%)	2,227 (36.1%)	0.045
Obstructive lung disease	62,567 (19.1%)	1,760 (28.5%)	0.221
Congestive heart failure	32,811 (10.0%)	1,118 (18.1%)	0.234
INTRAOPERATIVE CHARACTERISTICS			
Duration of surgery, min	69 (35 - 145)	60(31 - 146)	0.033
Surgical service			0.284
General surgery	20,205 (6.2%)	338 (5.5%)	
Gastroenterology	115,720 (35.4%)	2,318 (37.5%)	
Gynecology	21,784 (6.7%)	336 (5.4%)	
Others	169,355 (51.7%)	3,184(51.6%)	
Figure 1A Patient and procedural chai median (interquartile range) for continuo ASA: American Society of Anesthesiolo	us measures, and n (%) for cate	gorical measures.	resented as

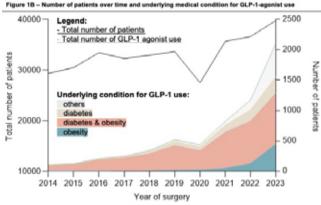


Figure 18 | Number of patients over time with the total amount of patients on the left y-axis and the total amount of patients with according underlying conditions for GLP-1 (Glucagon-like-peptide) agonists use on the right y-axis.

Methods: This single center retrospective cohort study included 339,168 patients undergoing anesthesia between 2014 and 2024. The primary exposure was GLP-1-agonist use and the primary outcome was PRC (pneumonia, reintubation, or emergency non-invasive ventilation within 7 days of surgery).

We performed Inverse Probability Weighted Regression Adjustment analysis with *a-priori* defined covariates (*Figure 1A*). Interrupted Time Series Analysis (ITSA) was conducted among GLP-

1-agonist users with the guideline publication date (06.29.2023 and subsequent institution-wide implementation) as intervention

Results: Among all patients, 6,176 (1.9%) used GLP-1-agonists preoperatively with an increase to 5.5% in 2024 and increasing frequency of obesity as underlying disease (*Figure 1B*).

The utilization of GLP-1 agonists was neither associated with PRC (average treatment effect (ATE) 2.9%, 95% CI -0.3 to 6.1%; p = 0.07) nor intraoperative hypoxemia (ATE 0.4%, 95% CI -3.0 to 3.9%; p = 0.83).

Among GLP-1-agonist users, there was no change in perioperative respiratory complications after implementation of the ASA guideline in adjusted ITSA for PRC (p-for-intercept=0.47 and p-for-slope change 0.49).

Conclusion: The study found no association between preoperative GLP-1-agonist use and perioperative respiratory complications. Neither were these affected by publication of a guideline to hold these medications prior to anesthesia

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10AP08-10

Post-transfusional hypertensive pulmonary edema – Is it always a transfusion reaction?

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Background: Blood transfusions inherently carry risks, including immunological and non-immunological complications. (1) Prematurely assuming a specific transfusion reaction, without thorough evaluation, can result in inappropriate management and lead to adverse outcomes.

Case Report: A 19-year-old woman, 26 weeks pregnant (ASA IV-E), with no significant medical history or known allergies, presented with obstructive urosepsis, that required emergent ure-teral catheterization.

Preoperative fluids were administered to address hypotension. In the Post-Anesthesia Care Unit, a hemoglobin level of 6.9 g/dL prompted transfusion of two units of red blood cells (RBC). One hour after the transfusion, the patient developed dyspnea, respiratory failure with hypoxemia, hypertension, along periorbital and labial edema. Lung auscultation revealed scattered bilateral crackles.

Clinical improvement occurred after administration of a bolus of furosemide, morphine, and hydrocortisone, along with an infusion of isosorbide dinitrate. Although the temporal association with the RBC units suggested a transfusion reaction, alternative causes such as fluid overload or cardiovascular dysfunction were also considered.

The patient was evaluated collaboratively with Immunohematology and Obstetrics and transferred to a level 2 ICU, where her clinical progress was favorable. Hemolysis markers were negative. Post-discharge follow-up continued in outpatient consultation, but a definitive diagnosis could not be established, as the clinical presentation featured elements of both allergic reactions and fluid overload. Recommendations were provided to ensure safety in future transfusions.

Discussion: This case highlights the importance of considering a broad differential diagnosis for acute hypertensive pulmonary edema after transfusion. Timely recognition and multidisciplinary management ensured a positive outcome for both mother and fetus.

Reference: Khan, A. I., & Gupta, G. (2022). Non-infectious Complications Of Blood Transfusion. PubMed; StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK574536/

Learning points: Thorough evaluation is essential to distinguish between transfusion reactions and alternative causes. Multidisciplinary collaboration is essential to managing post-transfusion complications effectively. Proper planning ensures safety during future transfusions.

10AP08-11

Cerebral oximetry as an index of microcirculation dysfunction in cardiac surgery

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Background and Goal of Study: Hemodynamic incoherence prompts for alternative monitoring parameters to detect dysfunctional microcirculation and improve patient care.

The goal of this study is to investigate arterial blood pressure (ABP) and cerebral oximetry (rSO_2) as indices of microcirculation dysfunction through time-weighted average (TWA) analysis.

Materials and Methods: Patients who underwent cardiac surgery were included. The 3-minute mean values of ABP and rSO₂ measurements during 3 phases were computed: before Cardio-pulmonary Bypass (CPB), during CPB and after CPB. Events of decompensation were set as mean ABP <65 mmHg or rSO₂ decline >20% of baseline.

The TWA = (depth x decompensation time)/total duration of the procedure was determined for each case. Hemoglobin, lactates, creatinine, duration of vasoactive medication and mechanical ventilation (hours) and morbidity were recorded.

Results and Discussion: Twenty patients were analysed. Mean age was 65±10 years and CPB duration was 93±29 min. Seven (35%) patients underwent CABG. The median (IQR) of perioperative TWA_{ABP} and TWA_{rSO2} was 19.7(62.5) and 0 (21.9) respectively. Correlation was insignificant between these parameters (p>0.05). TWA_{ABP} was related to the duration of mechanical ventilation (ρ =0.49, p=0.037). An association of TWA_{ABP} after CPB and creatinine was found (ρ =0.51, p=0.03). TWA_{rSO2} correlated with maximum postoperative lactates (ρ =0.58, p=0.015) and duration of noradrenaline infusion (ρ =0.48, p=0.048).

Patients with higher TWA $_{\rm ISO2}$ presented with higher creatinine values postoperatively (p=0.49, p=0.052). TWA $_{\rm ISO2}$ relation with lactates was stronger during CPB (r=0.62, p=0.007).

Patients with higher decline of haemoglobin developed higher creatinine values during their hospitalisation (ρ =0.49, p=0.037). No clinically significant cutoff point could be determined with

ROC curve analysis to predict morbidity.

Conclusion(s): The cerebral tissue may be valuable as an index organ for microcirculation as cerebral oximetry can be used to monitor microcirculation dysfunction that cannot be identified with macrocirculatory indices, as ABP.

Perioperative Care

10AP08-12

From dyspnea to diagnosis: a case of intraoperative pulmonary embolism during vascular surgery

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Background: Postoperative dyspnea is a common complication following surgery, with diverse etiologies involving pulmonary, cardiac, and miscellaneous underlying factors. Therefore, a systematic approach is essential to tackle it.

Case Report: A 57-year-old male, ASA II, previously submitted to a radical prostatectomy for prostate cancer, was admitted for elective excision of a right inguinal lymphocele. Calculated Caprini score was 6, indicating a moderate risk for venous thromboembolism.

The patient underwent a 5-hour complex surgery under balanced general anesthesia. During the procedure, the external iliac vein was accidentally sectioned, requiring a top-to-top anastomosis. Venous clampage lasted 20 minutes and 2000 IU of unfractionated heparin were given. The estimated blood loss was 1700 mL. Hypofibrinogenemia was corrected with 3g of fibrinogen. Anesthetic maintenance and emergence were uneventful.

However, post-extubation, the patient complained of persistent dyspnea despite normal oxygen saturation and an unremarkable ABG. Residual curarization, bronchospasm, pain, and hypoventilation were excluded. Oxygen support was given but did not improve symptoms.

Doppler ultrasound confirmed adequate venous and arterial flow in the operated limb. The patient was then transferred to the post-anesthesia care unit, where 2 episodes of hemodynamic instability and sustained sinus tachycardia occurred.

ABG revealed respiratory alkalosis. Angio-CT scan confirmed a right lobe pulmonary embolism (PE), while the echocardiogram was unremarkable. The patient was started on enoxaparin and later transferred to the ward without further complications.

Discussion: Postoperative dyspnea warrants careful evaluation. A comprehensive patient history, including medical background, surgical details, clinical signs and laboratory tests, is elementary when approaching these situations.

Atelectasis represents the most common cause, but excluding more serious conditions, such as PE, is imperative. Thoughtful management of anticoagulation and diligent monitoring are key, as PE can be silent but lethal.

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2. doi:10.1213/ANE.0000000000002183

Learning points: Dyspnea can stem from various causes. Despite most being benign, a thorough investigation is essential to exclude life-threatening conditions. PE requires a high level of suspicion. Thromboprophylaxis is vital during the perioperative period, particularly in vascular surgeries.

10AP09-1

Frequency and characteristics of perioperative hypersensitivity reactions: a national study in Brazil

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Background and Goal of Study: In Brazil, the data on the frequency and characteristics of perioperative hypersensitivity reactions (PHRs) are scarce. This study aims to map the frequency of PHRs reported by anesthesiologists.

Materials and Methods: This observational, cross-sectional study was conducted via a questionnaire distributed to all members of the Brazilian Society of Anesthesiology.

The survey asked anesthesiologists to report the frequency of PHRs they had encountered in the perioperative period through all their lives, focusing on clinical signs, timing, risk factors, and management strategies.

Results and Discussion: A total of 390 anesthesiologists (3.16% of invited participants) responded to the questionnaire, reporting 775 PHRs. The most common clinical signs of suspected hypersensitivity were hypotension (27.07%), cutaneous rash (64.22%), and broncho-spasm (10.47%).

The majority of reactions occurred after induction (38%), with fewer cases after incision (38%) and postoperatively (4.8%). In most cases, surgeries were not interrupted, and the majority of reactions were mild to moderate in severity, with few cases resulting in life-threatening outcomes.

The management strategies were below international standards, with only 7% of patients having blood samples taken for tryptase measurement, 56.5% receiving adrenaline and 61.94% receiving vigorous hydration, which contrasts with higher treatment rates seen in international studies (Mertes et al., 2019; Harper et al., 2018).

Conclusion(s): This national study on PHRs in Brazil reveals important gaps in the recognition, diagnosis, and management of these events.

Further studies and the establishment of a national registry are crucial and should be thinking by both Anesthesiology and Allergy Societies.

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Acknowledgements: The authors would like to express their gratitude to the Brazilian Society of Anesthesiology for distributing the questionnaires to its members.

Enhancing preoperative CXR appropriateness in a quaternary medical centre: implementing the choosing wisely de-implementation framework with the 4E's model

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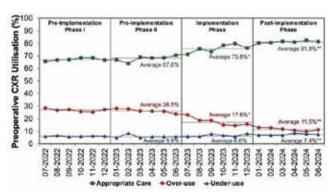
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Background and Goal of Study: Medical overuse, such as routine preoperative chest X-ray (CXR) with limited clinical benefit, leads to inefficiencies and unnecessary healthcare costs. The Choosing Wisely (CW) campaign promotes evidence-based practice, but recommendations alone often fail to change clinical practice. The Choosing Wisely De-implementation Framework (CWDIF), enhanced by the 4E's model—Educate, Embed reminders, Empower interprofessionals, and Enforce stewardship—is a promising but untested approach to drive meaningful change.

Therefore, we aimed to implement the CW preoperative CXR bundle using CWDIF and 4E's to evaluate its impact on CXR appropriateness, underuse, mid-term sustainability, and cost avoidance.

Materials and Methods: Our quasi-experimental study at Singapore General Hospital (July 2022–June 2024) included 29,103 adult patients undergoing elective non-cardiac surgeries and preanaesthetic evaluations. The CW preoperative CXR bundle was implemented using CWDIF, incorporating educational initiatives, workflow reminders, staff empowerment, and enforcement via updated electronic forms. Continuous monitoring and feedback were facilitated by data visualisation tools. The primary outcome was CXR appropriateness using clinical criteria. Secondary outcomes included CXR underuse, mid-term sustainability, and cost avoidance.

Results and Discussion: Our CW preoperative CXR bundle increased CXR appropriateness from 67.6% to 75.8% (*p*<0.001), with sustained improvement at 81.8% (*p*<0.001). Underuse rose slightly from 6.6% to 7.4% (*p*<0.001). The intervention achieved a 36.1% cost avoidance. These results suggest that CWDIF, enhanced by the 4E's model, is an effective strategy for driving clinical change, although refinement is needed to address CXR underuse.



Conclusion(s): The CW preoperative CXR bundle, implemented using CWDIF and 4E's, improved CXR appropriateness, ensured mid-term sustainability, and achieved significant cost avoidance. The slight rise in underuse highlights the need for ongoing moni-

toring and feedback. These findings suggest that similar de-implementation strategies could enhance efficiency and sustainability in other clinical settings.

10AP09-4

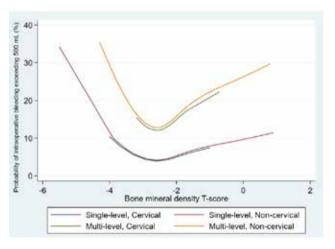
Association between bone mineral density T-score and intraoperative bleeding during spine fixation surgery: a retrospective cohort analysis

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Background and Goal of Study: Patients with osteoporosis are reported to be associated with postoperative complications after spinal surgery. In contrast, whether the severity of osteoporosis is related to the amount of intraoperative bleeding during spinal surgery remains unknown.

We thus tested the primary hypothesis that perioperative bone mineral density is associated with intraoperative bleeding during spine fixation surgery.



Materials and Methods: After ethical board approved the study, we performed a single center retrospective cohort analysis. We included female patients over 75 years of age having spine fixation surgery between January 2017 and December 2023. Our exposure of interest is bone mineral density T-score assessed by Dual Energy X-ray Absorptiometry within 6 months before surgery or 30 days after surgery.

The primary outcome is the probability of intraoperative bleeding exceeding 500 ml during surgery. The association between the T-score and log odds of intraoperative bleeding were found to be neither linear nor continuous. Furthermore, the association differs in terms of potential confounders.

Therefore, we performed logistic regression using the spline function and nonlinear smoothing to estimate the risk of intraoperative bleeding. The beta regression was also conducted to assess the risk factor of the intraoperative blood loss.

Results and Discussion: Among 481 patients analyzed, 11.6% experienced intraoperative bleeding exceeding 500ml. After smoothing, we found the negative association between perioperative bone mineral density T-score lower than -2.5 and intraoperative bleeding. The risk factors associated with the increased risk of intraoperative blood loss were the number of vertebrae fixed (1.07, 95%Cl: 0.95-1.12, p <0.001), non-cervical surgery (0.21, 95%Cl: 0.03-0.39, p=0.024), and the past medical history of ischemic heart disease (0.26, 95%Cl: 0.07-0.45, p=0.007). Further studies will be needed to find out whether the association is causal.

Conclusion: The bone mineral density T-score lower than -2.5 is negatively associated with the risk of intraoperative bleeding exceeding 500ml during spine fixation surgery.

10AP09-5

Compliance with haemodynamic targets in patients post oesophagectomy for oesophageal cancer

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Background and Goal of Study: Oesophagogastric cancers are commonly detected at late stages, and have the third lowest five-year survival rate¹, and just over a third are deemed curable at diagnosis². Surgical resection plays a key role in curative treatment, however, oesophagectomies are associated with complication rates of up to 63%. Up to one in five patients develop an anastomotic leak as a complication³. Haemodynamic protocols aim to maintain perfusion within the anastomosis to prevent breakdown. Our protocol recommends targeting a MAP80mmHg for the first six postoperative days⁴. We aimed to audit compliance with these targets in relation to complications.

Materials and Methods: In this retrospective audit, we collected data on patient demographics, complications (e.g., anastomotic leak, pneumonia), and haemodynamics over six post-operative days in all patients admitted to Critical Care after oesophagectomy. Data was captured using RedCAP and statistical analysis tests (Mann-Whitney U and Pearson's χ^2 test/Fisher's Exact Test) alongside descriptive statistics were used to analyse associations between haemodynamic parametres, requirements for vasoactive drugs and post-operative complications.

Results and Discussion: 31 patients were included, four of whom developed an anastomotic leak. 185 days of data was collected with only 47 days (25%) meeting the guideline target MAP. 11 patients developed pneumonia (35.4%), and 30-day mortality rate was 9.7%. There was no significant relationship between compliance and anastomotic leaks. Patients with anastomotic leaks had a significantly higher Comprehensive Complication Index (CCI)⁵ compared to those who did not develop an anastomotic leak (median:59.9 vs 20.9).

Conclusion(s): In this small sample, compliance with the local guideline, while poor, was not associated with anastomotic leaks. Larger cohorts and randomised controlled trials are required to define best haemodynamic targets for patients undergoing oesophagectomy.

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10AP09-6

Impact of a multimodal prehabilitation program in robotic oncological surgery: a randomized controlled pilot trial

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Background and Goal of Study: Prehabilitation has recently gained increasing interest as a strategy to begin the rehabilitation process before surgery. It aims to actively prepare patients through exercise, nutritional support, psycho-cognitive training, or a combination of these interventions.

The goal of this study is to evaluate the physical fitness of patients before and after surgery.

Materials and Methods: In this prospective, observer-blinded, randomized controlled pilot study, patients undergoing elective robotic oncologic urological surgery were allocated in a 1:1 ratio to an interventional group (n=10) receiving a multimodal prehabilitation program (including physical, stress reduction, nutritional, and cognitive components) for 2–4 weeks preoperatively, or a control group (n=11) receiving standard care. Physical fitness was assessed before and six weeks after surgery using the 6-minute walking test (6MWT), which measures the maximal distance (meters) a patient can walk in 6 minutes, and the Timed Up and Go (TUG) test, which measures the time required to stand, walk 10 feet, turn around, walk back, and sit down.

Outcome measures were analyzed using the Mann-Whitney U test for non-normally distributed data. A p-value <0.05 was considered statistically significant, and a p-value <0.01 was interpreted as a trend toward significance.

Results and Discussion: A total of 21 patients were included between January 17, 2023, and August 22, 2023. Baseline characteristics of the included patients are presented in Table 1.

A trend toward better 6MWT results was observed six weeks after surgery in the prehabilitation group compared to the control group (720 [570–735] vs. 570 [480–660] m, p=0.08). The TUG test results were significantly faster in the prehabilitation group compared to the control group six weeks after surgery (6 [6–6.5] vs. 8 [7–10] seconds, p=0.01).

Conclusion: The implementation of a multimodal prehabilitation program in elective robotic oncologic urological surgery improves physical fitness six weeks after surgery compared to standard care.

One-year outcomes of high-risk patients discussed in preoperative multidisciplinary team meetings: a multicenter prospective observational study

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Background and Goal of Study: Surgical patients with a high-risk of serious adverse events (SAE's) are increasingly selected for preoperative multidisciplinary team (MDT) discussions. The aim of the MDT discussion is to optimize the treatment plan by weighing risks and benefits, alternatives in treatment and patients' preferences.

The goal of this study was to assess long-term outcomes at one year for high-risk noncardiac surgical patients following discussion in a preoperative MDT meeting.

Materials and Methods: A prospective multicentre observational study was conducted in the Netherlands in nine hospitals. Each hospital included 25 consecutive high-risk noncardiac surgical patients selected for discussion in preoperative MDT meetings. Data on patient characteristics and outcomes were collected from electronic health records.

The primary outcome was mortality at one year postoperatively (surgical management) or post-MDT meeting (nonsurgical management).

Secondary outcomes included time to SAE or death (event-free-survival), occurrence of SAE's (Clavien Dindo classification \geq 3 or requiring hospital admission) and hospital admissions.

Results and Discussion: A total of 175 patients with complete follow up (175/225) were included in the current analyses. After MDT discussion, 52 (30%) patients received nonsurgical management and 123 (70%) underwent surgery. Of nonsurgical patients, 7 (13%) received palliative care versus 3 (2%) of surgical patients. Mortality at one-year was 42% for nonsurgical patients, of which the majority of deaths occurred within 3 months.

Patients undergoing surgery had a one-year mortality of 20% with over one-third of deaths occurring within 3 months. During the first year, almost half of patients discussed in an MDT were readmitted to hospital at least once.

Patients were readmitted on average twice at one year follow up (nonsurgical IQR 1-2; surgical IQR 1-3). SAE's occurred for 60% of nonsurgical patients and 46% of surgical patients. Nonsurgical patients with SAE's had a median event-free survival of 62 days (IQR 16-135) versus 21 days (IQR 6-78) in surgical patients.

Conclusion(s): Of non-cardiac surgical patients selected for preoperative MDT discussion, one-third received nonsurgical management after discussion.

In both surgical and nonsurgical patients the risk of mortality and SAE's at one year is high. Frequently, patients discussed in MDT meetings had hospital readmissions.

10AP09-8

Comparison of buprenorphine as adjuvant to intrathecal bupivacaine vs no adjuvants for lower limbs peripheral vascular disease reconstruction surgeries

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Background and Goal of Study: Regional anesthesia techniques are commonly used for many surgical procedures. Unfortunately,these techniques are partially limited by the time of anesthetics action. One method of overcoming this limitation is adding to the anesthetic adjuvant.

Among many adjuvants to local anesthetics tested so far one seems to be interesting-buprenorphine. Prolonging the pain-free interval is crucial for enhancing postoperative recovery and patient satisfaction.

Materials and Methods: Patients posted for Lower Limbs Peripheral Vascular Disease Reconstruction Surgeries in the age 65,3±10,03 years with ASA III and IV. Patients were divided in 2 Groups of 30 each. Group A (GA): 0.5% Bupivacaine 15 mg, group B (GB):0.5% Bupivacaine 15 mg with 60 mcg Buprenorphine. Duration of analgesia, onset of sensory and motor block, VAS, hemodynamic parameters and adverse effects were noted.

Results and Discussion: The duration of analgesia was significantly prolonged in GB ($381,63\pm47,23$ min) than GA ($238,33\pm32,27$ min) (p < 0,002). Onset and duration of sensory and motor blockade was not significantly different (SD).

Regression of motor block in GA (202,11 \pm 30,07min) and prolonged regression in GB (346,35 \pm 54,92 min) (p < 0,011).

Time of surgery GA (142,25 \pm 58,50 min) and with no SD with GB(151,37 \pm 51,48 min). VAS score was before surgery was not SD.GA (8,26 \pm 1,55),GB (7,86 \pm 1,96) (p <0,589). SD changes ware observed in VAS 24 hours after surgery GA (6,23 \pm 1,60), GB (5,20 \pm 11,57) and 48 hours GA (5,20 \pm 1,70),GB (5,13 \pm 1,69) (p<0,020).

Hemodynamic parameters were well preserved and SD changes ware observed only 6hrs after surgery GA (146,1 \pm 11,89), GB (139,1 \pm 12,24) (p <0,047). Drop of BP to 20% was in GA 6 (20%) compare to GB 4 (13,33%).

Higher incidence of PONV was in GB 4(13,33%) compare to GA 3 (10%) and was not SD. Urinary retention level was greater in GB 3 (10%) than in GA 2(6,67%).

Conclusion(s): Addition of 60mcg of buprenorphine to intrathecal bupivacaine prolonged the duration and quality of postoperative analgesia after Lower Limbs Peripheral Vascular Disease Reconstruction Surgeries with minimal adverse effects like urinary retention and PONV which were not significant to hinder recovery.

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Cardiac output and carotid flow time as major contributors to cerebral oxygenation in patients undergoing recruitment maneuver during one-lung ventilation

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Background: The brain, a vital organ, disproportionately receives about 12% of cardiac output (CO)¹. In healthy awake humans CO is an independent regulator of cerebral blood flow (CBF). However, in surgical population the relationship between CO and CBF is not well characterized².

Near-infrared spectroscopy (NIRS) monitors regional tissue oxygenation (rSO $_2$) and is widely utilized as a surrogate of CBF 3 . We decided to investigate if cerebral oxygenation would be affected by recruitment maneuver (RM) - a key component of intraoperative protective ventilation strategy during one-lung ventilation (OLV). RM is associated with transient hemodynamic compromise due to decrease in venous return and CO. It is known to cross-influence the heart, lungs and brain, but its impact on the latter is not studied in detail 4 .

We hypothesized that cardiorespiratory changes induced by RM would decrease cerebral oxygenation during OLV. Our study aimed to identify factors contributing to intraoperative regulation of CBF during OLV.

Methods: 30 patients undergoing elective lung resection were enrolled into the study. NIRS was used to monitor rSO₂. Carotid artery parameters (cFT) were obtained using with portable ultrasound device. Lung RM (35 cmH₂O) was performed after start of OLV. CO and MAP were recorded by pulse contour. Hemodynamic data and ABGs were collected at three timepoints: awake (baseline), before RM, at the end of RM. Statistical analysis was performed.

Results: Hemodynamic and NIRS values were analyzed in correlation and regression model to examine individual predictors and their effect on cerebral oxygenation. CO and carotid cFT were independently associated with mediated change in rSO $_2$ The average significant decrease in CO was 5.9 to 4.5 l/min, cFT 370 to 355 ms, rSO $_2$ 0.6%/min. In contrast, patient age, MAP and paCO2 were not associated with significant change in rSO $_2$.

Conclusion(s): Cerebral oxygenation significantly decreased during RM under one-lung ventilation, which is a solid indicator of RM impact on cerebral dynamics. cFT declined in close association with reduction in CO and rSO₂. We found clinical evidence that intraoperatively cerebral oxygenation, a surrogate parameter of CBF, is regulated by CO.

Further studies are warranted to determine whether cerebral oxygenation-guided interventions can potentially improve clinical outcomes.

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10AP09-11

Perioperative cardiac arrest and the chain of survival

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Background: Diabetes is the most common metabolic disorder, affecting 6–7% of the UK population and associated with higher perioperative morbidity and mortality in emergency surgeries!. This is due to co-existing microvascular and macrovascular complications!

Case Report: A 51- year- old male patient with poorly controlled diabetes was found exhausted and immobile at home after a fall on his right knee four days before admission. Initial investigations revealed glucose >27 mmol/L, HbA1c >200 mmol/mol, ketones 6.0 mmol/L and severe metabolic acidosis. He was diagnosed with diabetic ketoacidosis (DKA), which resolved within 54 hours of treatment.

He underwent an emergency arthroscopic washout for septic arthritis under general anaesthesia with Propofol and Alfentanil. Turbid fluid positive for Staphylococcus aureus was identified.

In the PACU, he developed hypotension and cardiac arrest. Return of spontaneous circulation (ROSC) was achieved after one CPR cycle but a second cardiac arrest occurred 15 minutes later. A prolonged downtime of 90 minutes followed with ROSC achieved after two doses of Alteplase. Haemodynamic stabilised and oxygenation improved temporarily.

Further ICU investigations revealed anteroseptal myocardial infarction and severely impaired left ventricular systolic function. Additional cardiac arrests occurred on days 1, 6, and 9 of admission, each achieved with ROSC. Persistent bradycardia complicated by sepsis precluded pacing. He succumbed on day 37 due to multiple organ failure with sepsis, AKI and recurrent cardiac arrests contributing.

Discussion: This case highlights severe cardiovascular complications in poorly controlled diabetes exacerbated by emergency surgery and infection.

Atherosclerotic cardiovascular disease is the leading cause of morbidity and mortality for diabetes patients.

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Learning Points: Emergency diabetic surgical patients require meticulous assessment, management and risk factor optimisation¹.

Post-cardiac arrest investigations including echocardiography, coronary angiography, and CT imaging are critical².

This case underscores the need for an integrated multidisciplinary approach in managing high-risk diabetic surgical patients.

Factors influencing postoperative serum magnesium levels in adult patients undergoing major abdominal surgery

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Background: Hypomagnesemia is a common yet under-recognised complication of surgical procedures, including major abdominal surgeries, and is associated with increased morbidity and mortality. Despite its clinical significance, limited research has explored its contributing factors.

This study aimed to assess how patient and perioperative factors influence serum magnesium levels after major abdominal surgery.

Methods: Adult patients scheduled for major abdominal surgery were recruited via preadmission clinic lists. After obtaining informed consent, data were collected on patient demographics, comorbidities, medication or supplement use, and perioperative variables such as bowel preparation, surgical details (e.g., type and duration), and pre- and postoperative serum magnesium levels. Binary logistic regression was employed to calculate odds ratios (OR), and model reliability was assessed using the area under the curve (AUC).

Results: Of 244 eligible patients, 196 were included in the analysis (mean age 59 ± 16 years; 51% female). Postoperative serum magnesium levels decreased significantly from 0.86 ± 0.08 mmol/L to 0.83 ± 0.11 mmol/L (t(195) = 4.91, p < 0.001, d = 0.35).

Significant associations were identified for male gender, reducing odds by 50% after adjustment for confounders (OR = 0.50, 95% CI [0.26, 0.99], p = 0.048) and prolonged surgical duration, with each additional minute increasing odds by 0.4% (OR = 1.004, 95% CI [1.000, 1.008], p = 0.069).

Trending but non-significant associations were observed for bowel preparation, which appeared to reduce odds by 44% (OR = 0.56, 95% CI [0.26, 1.21], p = 0.140) and fluid administration, where each additional litre increased odds by 29% (OR = 1.29, 95% CI [0.95, 1.76], p = 0.106).

Other factors, including age, comorbidities, surgery type, and medication use, showed no significant impact. The model demonstrated moderate reliability (AUC = 0.68).

Conclusions: This study confirms a significant decrease in serum magnesium levels after major abdominal surgery, particularly in females and those undergoing prolonged procedures. While most evaluated factors did not significantly affect magnesium concentrations, bowel preparation and fluid administration warrant further investigation as potential modifiable factors for maintaining perioperative magnesium homeostasis.

Further studies are needed to confirm these findings and explore targeted interventions.

Acknowledgements: Dr C Morrice & others helped data collection

10AP10-1

Retrieval augmented generation for 10 large language models and its generalizability in assessing medical fitness

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Background and Objective: Large Language Models (LLMs) have the potential to support medical tasks, yet they often lack the specific knowledge required for accurate clinical decision-making. Retrieval Augmented Generation (RAG) offers a solution by enhancing LLMs with specialized information, making them more applicable for healthcare needs.

This study aims to evaluate the effectiveness, accuracy, and reliability of RAG-based LLMs in determining a patient's readiness for surgery and providing essential preoperative instructions.

Materials and Methods: We developed RAG-based LLM models using 58 preoperative guidelines from both local and international sources. We tested these models against human responses in a total of 3682 evaluations. Document management and retrieval were handled by Llamaindex. Ten different LLMs, including GPT3.5, GPT4, GPT4-o, Gemini-1.5-Pro, Claude-3-Opus, and versions of Llama2 and Llama3, were evaluated in three ways: as native models, integrated with local guidelines, and integrated with international guidelines. We compared the model outputs to responses from four junior and four senior anesthesiologists from Singapore, the USA, and Taiwan.

The study examined six other important aspects of preoperative instructions in addition to assessing readiness for surgery. Based on established guidelines and expert clinical judgment, we checked model responses for accuracy. We used Fisher's exact statistical analysis test and measured agreement between human and model responses.

Results and Discussion: The LLM-RAG models showed impressive efficiency, generating responses within 25 seconds, much faster than the estimated 10 minutes typically taken by clinicians. Among the models, the GPT4-based LLM-RAG achieved the highest accuracy in assessing surgical fitness, outperforming human-generated responses (96.4% accuracy vs. 86.6%, with p=0.016). The RAG models performed consistently well across local and international guidelines, showing reliable and generalizable results.

Notably, the GPT4 model did not produce "hallucinations" (incorrect information) and provided preoperative instructions that closely matched those from clinical experts.

Conclusions: This study demonstrates that LLM-RAG models can effectively support preoperative tasks in healthcare. Their quick, accurate, and adaptable responses make them promising tools for use in clinical settings. These models could play an essential role in enhancing patient care.

10AP10-2

Is Mini-Mental Sate Examination a useful tool for early recognition of cognitive decline after cardiac surgery: a prospective cohort study?

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Background and Goal of Study: Postoperative cognitive decline (POCD) is a frequent complication following cardiac surgery with a significant adverse repercussion on patient health and health-care system. Diagnosis of POCD is difficult and it is based on the results of neuropsychological tests. A major obstacle in POCD diagnosis is represented by an absence of unique neuropsychological test battery among investigators.

Thus, the aim of the current study was to assess the sensitivity of Mini-Mental State Examination (MMSE) to detect POCD in comparison with most other commonly used neuropsychological tests

Materials and Methods: This prospective cohort study enrolled 62 patients scheduled for elective cardiac surgery with or without cardiopulmonary bypass. We performed neuropsychological analysis at 3 time points; preoperatively, 7 days and 4 years after surgery.

For cognitive assessment we used 10 following tests: MMSE, Rey Auditory Verbal Learning Test (immediate and delayed recall), Wechsler Memory Scale and its three subscales (visual memory span, digit span forward and backward), Symbol Digit Modalities Test, Trail Making Test (A and B) and computerized PsychE test (simple reaction time). The independent-samples t test was applied for comparisons of preoperative and postoperative neuropsychological test results.

Results and Discussion: MMSE determined POCD at both postoperative time points (P < 0.001) with more sensitivity than other applied tests. Moreover, a number of tests did not reveal POCD at all.

Our results suggest global cognitive decline during four years of follow-up, given that MMSE measures 5 areas of cognitive functions: orientation, registration, attention and calculation, recall and language. In addition, our search of the PubMed database disclosed a massive confusion among neuropsychological tests used in published studies for establishing POCD diagnosis (i.e., over 100 different tests).

Cognitive domains of memory, attention and psychomotor speed are commonly impaired following cardiac surgery; thus, selected tests must have an adequate sensitivity and specificity to cover different domains without overlapping but must also not exhaust the patient in the early postoperative period.

Conclusion: MMSE is a very sensitive and easy to use test for cognitive evaluation and it should be a part of neuropsychological test battery for early detection of such important postoperative issue, as POCD.

10AP10-3

Preoperative uric acid levels and postoperative delirium in spine surgery: findings from the Safe Brain Initiative (SBI) - preliminary results

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Background and Goal of Study: Postoperative delirium (POD) is associated with poor outcomes, including prolonged hospitalization, increased costs, and higher mortality rates, highlighting the importance of identifying its risk factors and prevention strategies. Uric acid, a natural antioxidant, may provide neuroprotection; however, recent studies suggest it may also predispose individuals to POD by contributing to white matter atrophy or modulating tau protein levels in cerebrospinal fluid.

Some studies report lower uric acid levels as a risk factor for POD, while others present contradictory findings. This study aims to investigate this relationship within the context of SBI.

Materials and Methods: This retrospective, single-center study investigated spine surgery patients from January 2023 to June 2024, following the SBI protocol at Ibn Sina Hospital, Ankara University, Turkey. Collected data included demographics, postoperative Nu-DESC scores, surgery time, and preoperative levels of uric acid, hemoglobin, neutrophils, lymphocytes, and neutrophilto-lymphocyte ratio (NLR). Patients with renal impairment, gout, neurological disorders, age under 18, or undergoing emergent surgeries were excluded. Data analysis was performed using SPSS Statistics, Version 17.0.

Results and Discussion: We enrolled 150 patients and, after excluding those ineligible or with missing data, analyzed 89. The prevalence of delirium was 12% (n=11), predominantly in women (n=9 vs. n=2). Most patients were classified as ASA II (n=57), and no significant correlation was observed between delirium and ASA status (p=0.79). The delirium group exhibited higher BMI, lower hemoglobin, and elevated inflammation-related parameters, though none reached statistical significance (p>0.05).

However, surgery time and preoperative uric acid levels were significantly higher in the delirium group (220 vs. 143 minutes, p=0.002; 5.84 vs. 4.77 mg/dL, p=0.007), suggesting a potential association.

Conclusion(s): These preliminary findings indicate a possible link between prolonged surgery duration, elevated preoperative uric acid levels, and an increased risk of postoperative delirium. While other factors, such as age, BMI, hemoglobin, and inflammatory markers, did not reach statistical significance.

The results underscore the need for more comprehensive studies to validate uric acid as a biomarker and its role in POD risk assessment and management.

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https://doi.org/10.3389/fnagi.2022.909738

10AP10-4

Dexamethasone, postoperative delirium and the role of hyperglycemia

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Background: Postoperative delirium (POD) may be precipitated by perioperative systemic inflammation (1). Dexamethasone is a corticosteroid commonly used to prevent postoperative nausea and vomiting and can attenuate perioperative inflammation.

However, a critical side effect of dexamethasone is hyperglycemia, which is an independent risk factor of POD (2).

We assessed whether intraoperative dexamethasone administration is associated with POD and whether this association is modified by postoperative hyperglycemia.

Methods: 92,832 adult hospitalized patients undergoing non-cardiac, non-neurosurgical, and non-transplant procedures between 2008 and 2024 at an academic medical center in Massachusetts, USA, were included.

Multivariable logistic regression models, adjusted for a priori-defined confounding variables, were used to assess the association between intraoperative dexamethasone administration and POD, identified by discharge note reviews, diagnostic codes, and confusion assessment scores.

Figure 1A – Patient characteristics				
	No Dexamethasone n=50,849	Dexamethasone n=41,983	Absolute Std. Diff.	
DEMOGRAPHICS				
Age, years	63.0 (52.0 - 73.0)	56.0 (43.0 - 66.0)	0.426	
Sex, female	23,558 (46.3%)	27,851 (66.3%)	0.412	
Federal insurance	25,144 (49.4%)	15,678 (37.3%)	0.245	
PREOPERATIVE CHARACTERIST	ics			
ASA physical status	3 (2 - 3)	2 (2 - 3)	0.509	
Elixhauser score	6 (0 - 16)	3 (0 - 10)	0.337	
History of (1 year prior)				
Diabetes	14,548 (28.6%)	4,938 (11.8%)	0.429	
Stroke	1,352 (2.7%)	417 (1.0%)	0.125	
Psychosis	178 (0.4%)	68 (0.2%)	0.637	
Apfelscore	2 (1 - 2)	2 (2 - 3)	0.460	
INTRAOPERATIVE CHARACTERIS	TICS			
Emergency surgery	8,337 (16.4%)	3,633 (8.7%)	0.236	
Inpatient admission	15,834 (31.1%)	6,681 (15.9%)	0.365	
Duration of surgery, minutes	154 (108 - 226)	183 (131 - 260)	0.264	
Night surgery	4,847 (9.0%)	1,880 (4.4%)	0.180	
Propofol dose, mg	200 (150 - 230)	200 (160 - 250)	0.136	
Opioid dose mg OME	45.4 (28.4 - 71.5)	42.0 (30.6 - 70.4)	0.005	

Figure 14. Patient and procedural characteristics, including key confounding variables. Data are presented as median (interquartile range) for continuous measures, and n (fu) for categorical measures. ASA: American Society of Amerinesiologists. Std.Diff. standardised difference. CME: oral morphine equivalents.

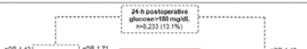


Figure 1B - Dexamethasone, hyperglycemia and postoperative delirium - a 4-way mediation analysis

BOR 1.43 ### BOR 1.71 ### BOR 1.45 ### B

Figure 18. In 4-way effect decomposition analysis, dexamethasone was associated with a lower relative risk of 7-day postoperative delivium. Dexamethasone was abse-dependently associated with 24-hours postoperative hyperglycemia, which, in turn, was associated with higher odds of postoperative delivium. The proportion of the effect of dexamethasone on delivium that could be avoided by hypothetically preventing postoperative hyperglycemia was estimated to be -11.5%. This means that by setting the mediator (postoperative hyperglycemia) to zero, we would avoid both its mediating and interactive effects, resulting in an increase of 11.5% in the protective association between dexamethasone and delivium.

Abbreviations kgBW kilogram actival body weight, aOR: adjusted odds ratio. Ct. confidence interval. ERR: excess relative risk.

Results: 41,983 (45.2%) patients received dexamethasone and 2,294 (2.5%) developed POD (Figure 1A). In adjusted analysis, dexamethasone was associated with a lower risk of POD independent of dosing (applied median dose 0.09 mg/kg body weight [0.07–0.12]; adjusted odds ratio 0.63 [0.56–0.71], p<0.001). Dexamethasone was dose-dependently associated with postoperative hyperglycemia (Figure 1B), which modified the association between dexamethasone and POD (p-for-interaction<0.001). 4-way effect decomposition analysis (3) suggested that if postoperative hyperglycemia could be avoided, the protective effect of dexamethasone on POD would be further increased by 11.5% (p=0.001, Figure 1B).

Conclusion: Intraoperative dexamethasone administration is associated with lower odds of POD. Higher postoperative blood glucose levels in patients receiving dexamethasone can compromise this association. Based on the 4-way effect decomposition, future studies should investigate if optimized blood glucose control can minimize POD risks and maximize the protective effects of dexamethasone.

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10AP10-6

Multimodal prehabilitation: impact of anaemia management on postoperative complicactions in patients scheduled for radical cystectomy due to bladder cancer

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Background and Goal of Study: Multimodal prehabilitation (MP) programs have been developed to enhance patients' physical and mental status before surgery, aiming to minimize postoperative complications and improve outcomes. Most patients with bladder cancer are anaemic and have poor physical baseline status.

The aim of this study was to analyse the prevalence and preoperative treatment of anaemia and its impact on postoperative complications and outcomes in prehabilitated patients scheduled for radical cystectomy due to bladder cancer.

Materials and Methods: Over a 4-weeks period before surgery, patients received personalized physical training, nutritional, and psychological support from a multidisciplinary team. Anaemia was defined and treated if the haemoglobin level was < 13 g/dL. Type of anaemia, its preoperative treatment, intraoperative bleeding, and transfusion needs were analysed.

The functional capacity of all patients was measured using the 6-Minute Walk Test (6MWT), handgrip strength, International Physical Activity Questionnaire (IPAQ), and maximal inspiratory pressure (MIP) measurements. Postoperative complications within 90 days were recorded.

Results and Discussion: A total of 28 consecutive prehabilitated patients scheduled for radical cystectomy were enrolled over a period of 8 months (75% male, mean age 71.6 years, all ASA III, 29.6% non-smokers). Of these, 16 patients (57.1%) were preoperatively anaemic (68.8% male); in 56.25% of the cases, anaemia was due to iron deficiency, and all of them were treated with IV iron. 43.8% of anaemic patients were frail (p=0.010). Intraoperative blood loss, transfusion rates (10.5%) and functional scores post-MP were similar among groups. 55.6% of anaemic patients developed a urinary tract infection (p=0.034). At discharge, 62.5% of the patients were anaemic. No statistical differences in LOS and postoperative complications were found. One anaemic patient died.

Conclusions: The prevalence of anaemia among our patients was 57.1%, with most being iron-deficient and treated with IV iron. Anaemic patients with bladder cancer who underwent radical cystectomy did not show statistical differences in terms of functional capacity compared to non-anaemics at MP-end. Postoperative urinary tract infection was more frequent in anaemia. Anaemia at discharge should be improved. No differences in postoperative complications were found among groups after anaemia correction and training during multimodal prehabilitation.

10AP10-7

Introducing ProphAbby: artificial intelligence-powered platform for surgical antibiotic prophylaxis recommendation

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Background and Goal of Study: Surgical antibiotic prophylaxis (SAP) is essential in reducing surgical site infections (SSI) across various surgeries. However, SAP guidelines are often lengthy and periodically updated, posing challenges for clinicians in referencing the latest guidance efficiently.

We designed an Al-powered assistant, named "ProphAbby," to recommend appropriate SAP in alignment with Singapore's national and institutional guidelines efficiently, with the aim to lessen cognitive burden on clinicians.

Materials and Methods: ProphAbby was subjected to testing with six hypothetical cases with complex patient profiles or special considerations such that standard antibiotics prophylaxis may not be suitable and its recommendations were validated internally for appropriateness.

In addition, ProphAbby was tested on 100 real-world surgical cases with its recommendations compared against Singapore National Surgical Antibiotic Prophylaxis Guidelines and the results were studied using Cohen's Kappa analysis model.

To assess ProphAbby's reliability, 2 independent raters evaluated the 100 cases 3 times each using S.C.O.R.E. Evaluation Framework and the mean score for each component of S.C.O.R.E between the 2 raters were compared using Weighted Cohen's Kappa for inter-rater reliability.

Results and Discussion: Amongst the 100 real-world surgical cases, 95 SAP recommendations by ProphAbby were accurate when compared against national guidelines. Using Cohen's Kappa analysis, a score of 0.7403 was obtained, suggesting substantial agreement between local national antibiotic guidelines and

ProphAbby. Based on Weighted Cohen's Kappa used to evaluate the scores of S.C.O.R.E. Evaluation Framework between the two independent raters, there was substantial agreement (k = 0.67), with a mean score of 4.78 and 4.85 respectively.

Conclusion(s): Our results indicate that ProphAbby is able to provide recommendations that were in substantial agreement with existing guidelines with high accuracy. This analysis underscores ProphAbby's potential as a reliable tool to aid clinicians in SAP decision-making, and will be particularly useful given its readily adaptable approach in dynamic clinical setting.

Nonetheless, limitations include the risk of Al hallucination and the necessity for clinician oversight. Future studies should focus on large-scale validation and enhanced functionality incorporating patient-specific microbiology data.

10AP10-8

Opioid-free anesthesia vs opioid-based anesthesia without remifentanil on postoperative nausea and vomiting and additional analgesic use: a propensity score-matched study

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Background and Goal of Study: Recent studies suggest opioid-free anesthesia (OFA) may reduce postoperative nausea and vomiting (PONV) and improve postoperative analgesia compared to opioid-based anesthesia (OBA). Since 2015, we have maintained a database to track PONV and analgesic outcomes in patients undergoing laparoscopic gynecological surgery, implementing propofol-based anesthesia, intraoperative dexamethasone, and IVPCA with droperidol and hydroxyzine (PCA-DH). This protocol has reduced the incidence of PONV to approximately 13%. While adopting OFA, we found OBA without remifentanil yielded similar PONV rates and reduced postoperative additional analgesic use. Therefore, the purpose of this study is to compare these approaches.

Materials and Methods: We first identified risk factors for PONV and postoperative additional analgesic use in patients with PCA-DH (Population A, n=3816) using logistic regression analysis (p<0.01). PONV-related factors included body weight, smoking, motion sickness history, and previous PONV; analgesic-related factors included age, body weight, surgical approach, fentanyl dose, intraoperative cholinesterase inhibitors, NSAIDs, and antihistamines. OFA group and OBA without remifentanil group were extracted from the Population A and propensity-matched by these factors in a 1:1 ratio. Matched-pair analysis using chisquared tests then compared PONV incidence and additional analgesic use between groups. P<0.05 is considered as significant. Results and Discussion: Of the 1,029 patients who met the study selection criteria, 585 received OBA without remifentanil, and 445 received OFA. Following propensity score matching, 442 matched pairs were analyzed for PONV, and 396 matched pairs were analyzed for postoperative additional analgesic use.

In matched pairs, all covariates achieved a standardized mean difference (SMD) <0.1. PONV incidence was comparable between groups (11.1% vs. 12.5%, p=0.60), but postoperative additional analgesic use was lower in the OBA group (20.2% vs. 31.6%, p<0.001).

Conclusion(s): In a setting with significantly reduced PONV, OBA without remifentanil shows similar PONV rates and significantly lower postoperative additional analgesic use than OFA.

10AP10-9

Regional anesthesia for surgical management of incomplete miscarriage in a patient with hereditary angioedema: a safe and effective approach – a case report

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Background: Hereditary Angioedema (HAE) is a rare autosomal dominant disorder characterized by recurrent episodes of angioedema, with significant mortality risk, especially when upper airway obstruction occurs. Surgical procedures, even minor ones, are well-known triggers for these episodes.

This case report illustrates the successful perioperative management of a patient with HAE undergoing surgical evacuation for an incomplete miscarriage.

Case Report: A 41-year-old woman, ASA II, 51 kg, with a history of HAE, presented for ultrasound-guided curettage after an incomplete miscarriage. She had prior episodes of angioedema involving the eyelids and lips, occasionally accompanied by skin rash and oropharyngeal tightness. Complement studies showed normal levels of C1, C1 inhibitor (C1-INH), C3, and C4, with normal C1-INH functional activity. She was not on regular prophylactic treatment.

Preoperative prophylaxis with 1000 IU of intravenous C1-INH (Berinert®) was administered 1 hour before the procedure. In the operating room, anxiolysis was achieved with 2 mg of IV midazolam, and a subarachnoid block was successfully performed with 8 mg of 0.5% isobaric bupivacaine. C1-INH concentrate and subcutaneous icatibant (Firazir®) were available in case of an acute crisis. The 35-minute surgery proceeded smoothly with excellent patient tolerance.

Postoperatively, she was monitored in the HDU for 24 hours without complications.

Discussion: This case demonstrates the effective management of a procedure typically performed under general anesthesia, using regional anesthesia to avoid airway manipulation in a HAE patient. It underscores the importance of careful preoperative planning and a multidisciplinary team to ensure proper prophylaxis and monitoring.

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Learning Points: HAE patients require meticulous preoperative planning involving a multidisciplinary team to ensure proper prophylaxis and minimize risks like airway obstruction. Regional anesthesia is an effective and safe option, reducing procedural triggers while ensuring patient comfort.

10AP10-11

Dose-dependent association between intraoperative dexmedetomidine administration and postoperative delirium: a retrospective cohort study

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Background: The use of dexmedetomidine can reduce risks of delirium in critically ill patients, but evidence on supplemental intraoperative dexmedetomidine administration and delirium in surgical patients remains equivocal [1,2]. We hypothesized that the risk of delirium after intraoperative dexmedetomidine depends on the dose administered.

Methods: 114,786 hospitalized adults undergoing general anesthesia for non-cardiac procedures at a tertiary academic medical center in New England, USA, between 2008 and 2024 were included. The primary exposure was intraoperative, supplemental administration of dexmedetomidine in mcg/kg body weight (BW), dichotomized based on the median in our cohort (0.49 mcg/kg BW). The primary outcome was delirium within 7 days, identified from discharge notes using a keyword-based search strategy paired with manual chart review, Confusion Assessment Method assessments, and International Classification of Diseases diagnostic codes [3]. Adjusted multivariable logistic and fractional polynomial regression analyses were applied.

	No desmadatumidina	Low-dose decredebookline	High-done decredebonistics	Maximum absolute std. difference
	n.+ 109,962	= + 2,402	++2,402	
Patient demographies and prescurative fa	ctors			
Age, years, near (50)	39 x 16	50 x 18	53 x 15	0.040
Body ruses index, kg/m², mean (SC).	28.8 4 6.0	21.8+58	297475	0.381
Sex, Nomes	10.01(51.95)	1,295 (63.9%)	1300 (65.4%)	0.023
Elidouser Conorticity Index	5 (5 - 15)	4.00-123	4 (0 - 15)	0.170
ASA physical status classification	87.10	0.01-10	H (H - HI)	0.084
Alcohol, tobanco-ox drug uwe	44,975 (40.9%)	1,002 (45.5%)	1.121 (48.7%)	0.112
Intracperative factors				
Surpor service"				1.246
Orthopedic surgery	27,139,04,750	817(21,8%)	494 (19.2%)	
Cirrenal surgery	15.903 (14.9%)	503 (30.9%)	204 (9.7%)	
Urskigy or gyrecology	17,298 (15,7%)	280171756	238 (9.8%)	
Duration of eurypsy, minutes, median (KQH)	160 (116 - 237)	100 (131 - 291)	248 (164 - 333)	0.072
Work relative units, median (IQR)	17.1 (10.6 - 22.6)	18.8 (12.5 - 23.2)	22.0 (95.6 - 30.8)	0.666
Dystelicit and collaid inflation, mt. median (CQR)	1,200 (900 - 2,000)	1.200 (900 - 1.750)	1.700 (1.200 - 2.600)	0.512
Propolal dose, mg, median (KDF).	200.0 (190.0 - 290.0)	240.0 (200.0 - 300.0)	375.0 (200.0 - 691.3)	0.590

Figure 1A. Patient characteristics.

Data are presented as mean (standard deviation (SDI), median (interquartile range (IQRI)) or number (frequency in 1%). ASA: American Society of Anesthesiologists. Desmedetomidine dose was dichotomized and classified as low or high based on the median in our cohort (0.49 mog/kg body weight). "Excerpt."

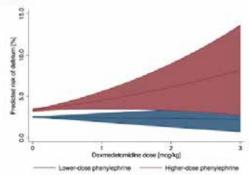


Figure 1B. Exploratory effect modification analysis.

The association between dexmedetomitine dose and risk of delirium was modified by the cadministration of higher doses of phenylephrine (3" tertile, p-5e-interaction=0.035).

Results: 4,804 (4.2%) patients received dexmedetomidine intraoperatively (Figure 1A), with a median (interquartile range) cumulative dose of 0.49 mcg/kg BW (0.28 to 0.84 mcg/kg BW). Postoperative delirium occurred in 3,227 (2.8%) patients, 39 (1.6%) among those receiving lower, and 97 (4.0%) in patients receiving higher dexmedetomidine doses.

Compared to no dexmedetomidine, the risk of delirium was lower in patients receiving lower doses of dexmedetomidine (ORadj 0.61; 95%Cl 0.44-0.85; p=0.004), which was not observed among those receiving higher doses (ORadj 1.06; 95%Cl 0.84-1.34; p=0.62).

This association was modified by the co-administration of higher phenylephrine doses (p-for-interaction=0.035), where dexmedetomidine dose-dependently increased the delirium risk (ORadj 1.42; 95%Cl 1.07-1.88; p=0.014 per mcg/kg BW increase, Figure 1B).

Conclusion: Low- but not high-dose dexmedetomidine administration was associated with lower odds of delirium, depending on intraoperative hemodynamic management.

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10AP10-12

Real-world deployment and evaluation of PErioperative Al CHatbot (PEACH) - a large language model chatbot for perioperative medicine

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Introduction: Preoperative assessment errors can lead to inefficiencies, increased healthcare costs, and surgical cancellations. The PErioperative AI CHatbot (PEACH) integrates local perioperative guidelines within a secure Retrieval-Augmented Generation (RAG) framework to assist clinicians in making accurate and consistent preoperative decisions.

This study evaluated PEACH's accuracy, safety, and user acceptability in real-world clinical settings.

Methods: A silent co-pilot model was implemented in a tertiary hospital's preoperative evaluation clinic, involving 80 clinical scenarios analyzed across 240 interactions. PEACH outputs were compared to institutional guidelines, international standards, and consultant decisions.

Deviations, hallucinations, and inter-rater reliability (IRR) were assessed. Usability was evaluated using the Technology Acceptance Model (TAM). A distinct n-gram analysis assessed response consistency and linguistic diversity.

Results: PEACH achieved an accuracy of 97.5% in its first iteration and 96.8% across three iterations, demonstrating consistent performance (93.8% agreement across iterations).

Hallucination and deviation rates were low, at 1.7% and 0.4%, respectively. Agreement with consultants showed substantial reliability (Kappa 0.73).

There was high internal consistency among PEACH iterations (Kappa 0.89 and 0.77). TAM ratings reflected high user satisfaction, with 95% of users agreeing that PEACH improved clinical decision-making efficiency.

Distinct n-gram scores averaged 0.309 (1-gram) and 0.592 (2-gram), indicating a balance between linguistic diversity and consistency suitable for clinical applications.

Conclusion: PEACH demonstrates high accuracy, reliability, and user acceptability, supporting its use as a clinical adjunct for preoperative decision-making. Its ability to integrate local and international guidelines, ensure data security, and maintain low hallucination rates underscores its potential to enhance clinical workflows, reduce variability, and alleviate clinician workload. Future work will focus on optimizing guideline integration and refining adaptive retrieval mechanisms to enhance its scalability and continued relevance.

10AP11-1

Contrast induced acute kidney injury (CI-AKI) in lower limb percutaneous transluminal angioplasty: a machine learning approach for preoperative risk prediction

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Background and Goal of Study: Contrast-induced acute kidney injury (CI-AKI) is a frequent complication of lower limb percutaneous transluminal angioplasty (PTA). Existing risk models, developed for cardiology cohorts undergoing percutaneous coronary intervention, omit key predictors like inflammatory markers and preoperative medications. Additionally, these models do not leverage machine learning. This study aimed to develop a preoperative risk model for CI-AKI in lower limb PTA using machine learning and compare its performance with conventional logistic regression.

Materials and Methods: A retrospective cohort of 456 patients who underwent isolated lower limb PTA from 2015 to 2019 was analyzed, excluding those with an Estimated Glomerular Filtration Rate (eGFR) <15 mL/min/1.73 m². Logistic regression and multiple machine learning models were trained using five-fold cross-validation and hyperparameter optimization. Performance metrics, including area under the receiver operating curve (AUROC), area under the precision-recall curve (AUPRC), F1 score, sensitivity, and specificity, were evaluated. Variable importance was analyzed using SHAP (SHapley Addictive exPlantations) plots.

Results and Discussion: The K Nearest Neighbours algorithm demonstrated the best performance (AUROC = 0.914, AUPRC = 0.809). Key predictors included Modification of Diet in Renal Disease (MDRD) eGFR, hemoglobin levels, and inflammatory markers such as neutrophil-to-lymphocyte ratio and red cell distribution width, as identified through SHAP plots.

Conclusion(s): Machine learning models, using exclusively preoperative variables, accurately predicted CI-AKI risk in patients undergoing elective lower limb PTA. These models can aid in preoperative risk counseling and identifying high-risk patients for enhanced monitoring or preventive interventions.

The ascending reticular activating system and its implications in neuraxial anesthesia: coma secondary to epidural anesthesia: a case report

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Background: Epidural anesthesia is a common technique for surgical and chronic pain management, but it carries rare risks, including coma. This case details an unusual prolonged coma following epidural anesthesia, emphasizing the importance of recognizing and addressing such complications, particularly in elderly patients with comorbidities.

Case Report: An 85-year-old woman underwent revision surgery for a periprosthetic femur fracture under subarachnoid anesthesia. Her history included chronic kidney disease, hypertension, diabetes, hypothyroidism, and anticoagulated atrial fibrillation.

Despite multimodal postoperative analgesia, severe pain persisted, prompting the initiation of epidural anesthesia via a lumbar catheter (L2/L3). A 2% lidocaine test dose (3 cc) was negative, followed by 0.125% levobupivacaine (fractioned 10ml).

Shortly after, the patient exhibited transient unresponsiveness initially attributed to vasovagal syncope. However, 25 minutes later, her neurological status deteriorated, presenting a Glasgow Coma Scale (GCS) of 3, unreactive pupils, and no response to naloxone, excluding opioid overdose.

Laboratory results and imaging, including a thoracic CT showing an incidental pulmonary embolism, failed to explain her condition. Differential diagnoses considered included subdural block, ischemic stroke, and rare anesthetic complications.

Transferred to intensive care, the patient regained full consciousness within 7 hours without deficits and was discharged from the ICU after 36 hours.

Discussion: Epidural analgesia, although effective, can cause rare complications such as transient coma. This case highlights the possible involvement of the ascending reticular activating system (ARAS), responsible for cortical arousal. Epidural anesthesia may disrupt sensory input to the ARAS, leading to temporary consciousness impairment.

Prompt recognition and intensive care support were critical in ensuring the patient's full recovery. This case underscores the importance of understanding the neurological effects of epidural anesthesia, thorough monitoring, and timely intervention for managing unexpected postoperative events.

Further research into ARAS-related mechanisms in neuraxial anesthesia is essential to improve perioperative safety.

Learning Points: Epidural anesthesia poses rare risks such as transient coma. ARAS involvement in consciousness regulation highlights the need for further investigation into neuraxial anesthesia's neurological impacts.

10AP11-3

The effect of adding intrathecal Ketamine to spinal anaesthesia on post operative pain in patients undergoing major colorectal surgical procedures

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Background: Enhanced Recovery After Surgery (ERAS) protocols advocate spinal anaesthesia in laparoscopic colorectal surgery, highlighting it's potential to reduce systemic opioid consumption in combination with intrathecal opioids.^{1,2}

Ketamine, recognized for its analgesic properties, may enhance the effectiveness of opioid analgesia when administered intrathecally.³

This study investigates the impact of adding intrathecal ketamine to spinal anaesthesia for post-op pain management in patients undergoing major colorectal surgical procedures, with a focus on postoperative opioid consumption.

Methods: A retrospective chart review was conducted on patients who received either intrathecal bupivacaine and morphine or a combination of intrathecal bupivacaine, morphine, and ketamine, June 2023 to September 2024.

The analysis included 20 patients, with outcomes measured in terms of oral morphine equivalent (OME) usage in the 48-hour postoperative period, time to breakthrough analgesia, self-reported pain scores, complications, and length of hospital stay.

Results: The mean OME usage in the 48 hr post-op period for the intrathecal morphine group was 106 mg (95% CI 64.7 to 147.9), while the group receiving ketamine in addition to morphine had a mean OME of 52.5 mg (95% CI 26.5–78.6), yielding a statistically significant difference of 53.5 mg (p 0.0463).

Self-reported pain scores showed minimal differences between the two groups, the ketamine group reporting slightly lower scores at 24- and 48-hrs post-op.

Adverse effects were minimal, minimal postoperative nausea and hypotension were noted. The mean length of hospital stay was significantly reduced in the ketamine group (3.7 days) compared to the morphine group (6.3 days).

Discussion: This audit proposes that intrathecal ketamine significantly reduces postoperative opioid requirements and may improve analgesia in patients undergoing laparoscopic colorectal surgery.

However, limitations include the small sample size and variability in post-op analgesic regimes, necessitating further research, supporting these findings, and optimize pain management strategies in major colorectal surgery.

Conclusion: The addition of intrathecal ketamine to spinal anaesthesia may offer a valuable adjunct in postoperative pain management, aligning with multimodal analgesia principles and ERAS protocols. Future prospective studies are warranted to validate these results to enhance outcomes in colorectal surgery patients.

Evaluation of diaphragm excursion with ultrasonography in the perioperative period in laparoscopic surgeries and its association with pain

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Background and Goal of Study: Pneumoperitoneum created in laparoscopic surgery (LC) causes postoperative ventilation dysfunction associated with a combination of reflex diaphragm inhibition and pain. Diaphragm movement may be reduced due to prolonged pneumoperitoneum and severity of postoperatif pain.

We aimed to evaluate the change of diaphragm movement in the perioperative period by investigating the change of diaphragm excursion (DE) that measured by ultrasonography (USG) and whether DE could be used as a more objective form of visual analog scale (VAS).

Materials and Methods: In this prospective observational study, we included 106 adult patients with ASA I-III who underwent elective LC after ethics committee approval and patient consent. Demographic variables, preoperative and postoperative DE values and vital signs, duration of surgery and anesthesia and postoperative VAS scores of the patients were recorded. DE was measured in the subcostal region with an M mode convex probe. Three consecutive measurements were taken from the right diaphragm and recorded.

Results and Discussion: While the mean preoperative DE was 18.91±2.90 mm, this value was 16.31±3.64 mm in the postoperative period. Initial DE values were shown to be significantly correlated with body mass index, height and age (P<0.001). The mean DE was significantly higher in males compared to females (P<0.001). It was determined that the decrease in the postoperative mean DE (%13.9) compared to the preoperative mean DE of the cases was statistically significant (p<0.001).

We showed that mean postoperative DE was lower in patients with higher VAS scores(P<0.001). Patients with VAS≥5 were considered as having "severe pain".

It was observed that the area under the curve (AUC) calculated for the presence of pain in the postoperative DE parameter of the patients was statistically significant (p<0,001). A cut-off value was determined for VAS≥5. This value was calculated as 15.9 mm in females (AUC:0,715; p<0,001) and 18.9 mm in males (AUC:0,761; p<0,001).

Conclusion(s): In our study, it was objectively shown that LC and postoperative pain restricted diaphragm movements. This relationship between the postoperative DE and VAS; it has led to the conclusion that DE is an objective measurement that can be useful of predicting pain, and it can provide information about the VAS scores, especially in the patient group with limitations in understanding or expressing themselves.

10AP11-5

Evaluation of the qNOX index performance during propofol sedations in endoscopic retrograde cholangiopancreatographies (ERCP)

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Background and Goal of Study: Excessive sedation and analgesia during endoscopies can lead to cardiovascular and respiratory issues, whereas low levels, pain and discomfort for both the patient and the physician.

The aim of this study is to assess the qNOX performance during ERCP as a tool to safely manage sedations.

Materials and Methods: After IRB approval, 21 patients scheduled for ERCP were enrolled. Sedation used 1 mg midazolam plus continuous propofol at 4–7 mg/kg/h. Surgical stimuli were classified as positive response (PR) if ≥15% increase in heart rate, blood pressure, or movement occurred, followed by a propofol bolus. Patients were monitored with qCON2000(R), an EEG device providing qCON (anesthesia depth) and qNOX (responsiveness to pain). Anesthesiologists were blinded to index values.

Stimuli were categorized as PR or no response (NR). Pre-stimulus qNOX/qCON were averaged 90–30 seconds before stimuli to exclude artifact. Lilliefors and t-student tests (p < 0.05) compared both groups of stimuli.

Results and Discussion: Patients were ASAI-III adults from both genders, aged 72 ± 16 years, weight 77 ± 17 kg and height 166 ± 9 cm (mean \pm standard deviation). Average perfusion rate was 5.74mg/kg/h and bolus administered after PR ranged from 20 to 70mg (30mg/bolus in average). Data from 49 stimuli were recorded, 31 presenting patient response. Table 1 shows the values obtained for the t-test performed to the qNOX values of PR and NR, as well as to the qCON values.

Conclusion(s): Provided that no analgesics were used, deep propofol sedation was responsible for reducing reactions to nociceptive stimuli. No qCON differences were found between PR and NR, suggesting that both had a similar level of consciousness, while nociception balance assessed by qNOX appeared to be different, correlated to responsiveness.

Therefore, qCON and qNOX might be two complementary EEG based indexes useful to manage sedation and pain during ERCP. **References:**

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Acknowledgements: Patricia Capsi, Patricia Pineda, Carmen González Erik Weber Jensen - Quantium Medical Spain.

Effects of discontinuation versus continuation of renin-angiotensin system inhibitors before non-cardiac surgery: a systemic review and meta-analysis of randomized controlled trials

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Background and Goal of Study: The optimal strategy for continuing or discontinuing renin-angiotensin system inhibitors in surgical patients remains uncertain. This meta-analysis aims to clarify whether a continuation strategy versus a discontinuation strategy of angiotensin-converting enzyme inhibitors (ACE-Is) and angiotensin receptor blockers (ARBs) before surgery reduces postoperative mortality and myocardial injury after non-cardiac surgery.

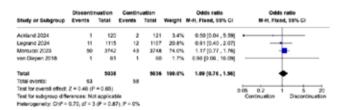
Materials and Methods: We conducted a search of the PubMed, Embase, and Cochrane databases for randomized controlled trials (RCTs) comparing the continuation versus discontinuation of ACE-Is and ARBs from inception to October 15, 2024.

The primary outcome was all-cause mortality at 30 days. Secondary outcome was the incidence of myocardial injury after non-cardiac surgery (MINS).

Meta-analyses were performed using Cochrane RevMan software version 7.12.0 to calculate odds ratios (ORs) and 95% confidence intervals (CIs) using a random-effects model.

Results and Discussion: Four studies were analyzed, involving 10,074 patients receiving ACE-I or ARB therapy prior to non-cardiac surgery. Of these patients, 5,038 discontinued their ACE-I/ARB therapy on the morning of surgery, while 5,036 continued their treatment. The pooled odds ratio (OR) for all-cause mortality was 1.09 (95% CI: 0.76–1.56; I-squared index: 0), indicating no significant difference between the two groups.

Similarly, there was no difference in the rate of MINS between the discontinuation and continuation strategies (pooled OR: 1.00, 95% CI: 0.89–1.14; I-squared index: 0).



Conclusion(s): Our results suggest that the continuation of ACE-Is or ARBs prior to non-cardiac surgery is not associated with the rates of all-cause mortality or myocardial injury compared to a discontinuation strategy. Individualized hypotensive management should be considered during the perioperative period. Further studies are needed to determine the optimal strategy for high-risk patients or surgical procedures.

10AP11-9

Patients' understanding and recollection of information about anaesthesia after attending pre-operative assessment clinic

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Background and Goal of Study: Effective communication of anaesthetic information in the Preoperative Assessment Clinic (POAC) is vital to empower patients to make informed decisions and consent for their anaesthetic care.

We carried out a telephone questionnaire to assess the patients' understanding and recollection of the anaesthetic information provided during their POAC visit, including the risks and the complications discussed.

Materials and Methods: The local ethics board approved this study. Consent for participation was obtained from 227 adult patients attending POAC over a four week period. The patients were contacted by phone a few days after their appointment. They were asked a set of predetermined, simple and specific questions about the anaesthesia and risks discussed during their visit with the foundation year doctors.

Results and Discussion: Out of 227 patients, 203 completed the questionnaire. 81 patients were unaware of the anaesthetic type they would receive. 125 patients were told about complications, but 28 could not recall any. Commonly recalled complications included nausea, vomiting, non-specific cardiac/respiratory problems and death. 91 patients felt uninformed about anaesthesia risks related to their comorbidities. Although 89 patients wanted more information, only 31 sought further clarification during their visit.

Patients were either not fully informed, did not understand or did not retain information, highlighting a gap, which does not meet the standards outlined in the *AAGBI: Consent for Anaesthesia 2017* guidelines. Contributing factors include insufficient knowledge by junior doctors, time constraints, and complex medical jargon.

Conclusion(s): We came up with the following recommendations to inform and aid retention:

- 1. Distribution of patient-friendly short leaflets in various languages about anaesthesia and its complications,
- 2. Slide show presentation in the waiting area,
- 3. Train young doctors in basic information about anaesthesia,
- 4. Encourage time for questioning and provide a contact email and phone number,
- 5. Provide written information about common co-morbidities and their implications during the peri-operative period.

We are hoping that these small steps lead the patients towards a truly informed consent for anaesthesia.

References:

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https://www.aagbi.org/sites/default/files/AAGBI_Consent_for_anaesthesia_2017_0.pdf

Acknowledgements: Our kind POAC nurses

Effect of preoperative carbohydrate loading on perioperative blood glucose levels and preoperative gastric volume in diabetic patients undergoing elective major surgery - a randomised controlled trial

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Background and Goal of Study: The ERAS protocol recommends liberal fasting and preoperative carbohydrate ingestion 2-3 hours prior to surgery, with proven benefits of decreasing metabolic response, preoperative hypoglycemia, postoperative insulin resistance, and better patient wellbeing. However, there is dearth of evidence for the success of preoperative carbohydrate loading in diabetic patients.

The aim of the study was to compare perioperative blood glucose levels, preoperative gastric volume and patient comfort between carbohydrate and clear fluids loaded group in diabetic patients undergoing elective major surgery.

Materials and Methods: This was a single blinded randomised controlled trial done in 134 diabetic patients undergoing elective major surgery. Patients were randomized into groups - C & F. Group C received carbohydrate drink night before [400mL of 100g] and 2 hours [200mL of 50g] prior to surgery and Group F received plain water 400ml and 200mL respectively. Perioperative glycemic levels, preoperative gastric volume and patient comfort [thirst and hunger], PONV, and duration of hospital stay were assessed

Results and Discussion: The study revealed higher blood glucose levels 1hour postdrink (175.19±44.195 vs 113.19±18.337) (p<0.001) and intraoperatively (133.49±19.147 vs 119.84±19.861) (p<0.001), in carbohydrate group, but within acceptable levels in majority of patients. The mean postoperative blood glucose level was higher in the clear fluids group (140.66±21.575 vs 133.35±36.478) (p 0.161). The carbohydrate loaded group had a higher preoperative gastric residual volume (56.17±24.05 vs 45.9±23.078) (p 0.008), without any increased risk of aspiration (GRV not >1.5mL/kg). PONV was comparable (p 0.680). Carbohydrate group experienced reduced preoperative thirst(p<0.001) and hunger (p<0.001) making the patients more comfortable pre-induction.

Conclusion(s): Preoperative carbohydrate loading demonstrated positive outcome in terms of better patient comfort with acceptable pre and intraoperative blood glucose levels and no increased risk of postoperative hyperglycemia, pulmonary aspiration or PONV. Hence, it may be recommended in well controlled diabetic patients undergoing major elective surgeries. FUTURE STUDIES 1. study with a single type of surgery may have a comparable surgical stress.2. Studies assessing the ideal volume and time interval of carbohydrate drink to be loaded without increasing gastric volume in diabetic patients.

References:

Laffin MR, Li S, Brisebois R, Senior PA, Wang H. The Use of a Pre-operative Carbohydrate Drink in Patients with Diabetes Mellitus: A Prospective, Noninferiority, Cohort Study. World J Surg. 2018 Jul;42(7):1965–70. Rajan S, Rahman AA, Kumar L. Preoperative oral carbohydrate loading: Effects on intraoperative blood glucose levels, post-operative nausea and vomiting, and intensive care unit stay. J Anaesthesiol Clin Pharmacol. 2021;37(4):622–7.

10AP11-11

Neuromuscular turmoil: unmasking a postoperative myasthenic crisis

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Background: Myasthenia gravis (MG) is a rare autoimmune disorder of the neuromuscular junction characterized by fluctuating skeletal muscle weakness. Perioperative management, especially during emergency surgeries, presents challenges.

Interruption of MG therapy and inadequate neuromuscular blockade monitoring can precipitate myasthenic crisis, a life-threatening complication.

Case Report: A 75-year-old man with a medical history of diabetes mellitus, hypertension, ischemic cardiomyopathy, and MG underwent emergency thromboembolectomy for acute mesenteric ischemia. MG treatment had been discontinued two days prior to surgery.

General anesthesia was used with rocuronium (100mg) without intraoperative neuromuscular blockade monitoring and reversed using sugammadex (400mg). The surgery proceeded without complciations, and the patient was transferred to the Intensive Care Unit (ICU) for continuous monitoring and postoperative care. Upon ICU admission, the patient exhibited respiratory distress and acidemia (pH 7.20), unresponsive to non-invasive ventilation

A myasthenic crisis was suspected, likely precipitated by the interruption of MG therapy and surgical stress. The patient required reintubation, and a neurology consult advised intravenous immunoglobulins (IVIG, 30 g over 5 days) and prednisolone (10 mg/day). Pyridostigmine was also reintroduced postoperatively. The patient's recovery was gradual and prolonged.

After nine days, he was successfully extubated and placed on 2 L/min of nasal cannula oxygen. No additional neurological complications occurred.

Discussion: This case highlights the risk of MG crisis in the perioperative period, emphasizing the crucial need for neuromuscular monitoring and continuation of MG therapy whenever feasible. Prompt recognition and initiation of immunomodulatory treatments were pivotal to recovery.

Reference:

1. Watanabe A, Watanabe T, et al. Perioperative management in myasthenia gravis patients: A review. *Ann Thorac Cardiovasc Surg.* 2019;25(2):1-8.

Learning Points:

- 1. Surgical stress and interruption of MG therapy are significant risk factors for postoperative myasthenic crisis.
- 2. Neuromuscular blockade in MG patients must be carefully monitored to avoid underestimation of residual paralysis.
- 3. Early intervention with IVIG and corticosteroids can prevent severe complications and improve outcomes in postoperative myasthenic crises.

Anesthetic challenges in Ehlers-Danlos syndrome: a multidisciplinary approach for perioperative management

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Background: Ehlers-Danlos syndrome (EDS) is an inherited connective tissue disorder with an incidence of 1/5000, characterized by hyperlaxity of the skin, tissues, trachea, larynx and vascular fragility. The hypermobile type, the most common, is often associated with dysautonomia manifest as postural orthodontic tachycardia syndrome (POTS) and hypotension episodes.

These patients present significant anesthetic risks including bleeding, airway complications, abnormal autonomic responses, and resistance to local anesthetics(1).

Case report: A 43-year-old male with hypermobile EDS and Addison's disease, fibromyalgia and POTS who underwent joint fixation surgery for chronic foot instability. Spinal anesthesia was performed at the L3-L4 level using 7.5 mg of bupivacaine, combined with an ultrasound-guided femoral nerve block with 20 ml of 0.75% ropivacaine. Perioperative stress-dose hydrocortisone was administered in order to prevent adrenal insufficiency.

Discussion: This case illustrated the complexity of anesthetic management in EDS patients, who require individualised care. Chronic pain, neuropathy, and resistance to local anesthetics complicate perioperative pain control. Current evidence does not support a position between general and regional anesthesia. the approach should depend on comorbidities and previous anesthetic experiencies.(2)

Complications such as dysautonomia, tissue fragility, or difficulties with airway must be anticipated. Dysautonomia and POTS, requires careful fluid management and hemodynamic monitoring. Adrenal insufficiency, often secondary to hypothalamic-pituitary-adrenal axis dysfunction, is another critical concern.

Surgical stress can precipitate adrenal crises, which highlights the importance of preoperative evaluation and glucocorticoid supplementation.

References: Wiesmann, T., Castori, M., Malfait, F., & Wulf, H. (2014). Recommendations for anesthesia and perioperative management in patients with Ehlers-Danlos syndrome(s). Orphanet Journal of Rare Diseases, 9, 109. https://doi.org/10.1186/s13023-014-0109-5. Chopra, P., Tinkle, B., Hamonet, C., et al. (2017). Pain management in the Ehlers-Danlos syndromes. American Journal of Medical Genetics Part C, 175(1), 212–219. https://doi.org/10.1002/ajmq.c.31554

Learning points: Screen for poor local anesthetic response and anesthetic risks. Manage dysautonomia with fluid optimization. Assess adrenal function and provide stress-dose hydrocortisone if needed.

10AP12-1

Intra-operative care in uterine transplantation: a case report of a living-donor procedure

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Background: Uterine transplantation is a promising solution for uterine factor infertility, with advancements in surgical techniques and immunosuppressive medications enhancing its feasibility. It is most commonly performed in patients with Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome¹, and only a few institutions worldwide have experience with living donors.

Case Report: This case involved sisters aged 31 (donor) and 34 (recipient), both classified as ASA I. The recipient had MRKH syndrome. An identical anesthetic protocol was used for both surgeries, with minimal bleeding reported. Spinal anesthesia was performed using morphine, fentanyl and sufentanil for postoperative analgesia, while general anesthesia induction included propofol, sufentanil and succinylcholine. Maintenance consisted of sevoflurane (2–3%, MAC 1–1.3), remifentanil infusion (0.1–0.3 μ g/kg/min), and cisatracurium (0.1 μ g/kg/min). Monitoring included BIS, cerebral oximetry, central venous line and temperature.

In the donor procedure, a Flowtrack/Hemosphere monitor was employed to manage hemodynamics and fluid balance. The surgery lasted 12 hours, with the donor successfully extubated in the operating room.

The recipient's surgery began 8 hours later. Before uterine implantation, basiliximab (20 mg) and methylprednisolone (500 mg) were administered, and 5,000 U of heparin was given before arterial and venous anastomoses were released. The total ischemia time was 265 minutes, and no hemodynamic changes occurred during the procedure. Ultrasonography confirmed adequate blood flow through uterine vessels.

Discussion: Experience with living donor uterine transplantation is limited in Latin America. Living donors offer advantages such as reduced cold ischemia time and better surgical planning but raise ethical concerns. This case demonstrated minimal hemodynamic fluctuations, absence of reperfusion syndrome and negligible bleeding, suggesting uterine transplantation may elicit unique physiological responses compared to other solid organ transplants ².

References:

- 1. Brännström M, et al. Transplantation. 2018;102(4):569-77 2. Manning MW, et al. J Cardiothorac Vasc Anesth. 2020;34(2):501-
- 3. Kisu I, et al. Transplant Proc.2018;50(9):2783-8.

Learning Points: Living donor uterine transplantation is a significant advancement for uterine factor infertility³.

However, limited studies and reviews challenge the establishment of standardized protocols, emphasizing the need for further research

10AP12-2

Comparing adherence to Procedure Specific Postoperative Pain Management (PROSPECT) guidelines in Median Sternotomy (MS), Total Hip Arthroplasty (THA) & Total Knee Arthroplasty (TKA)

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Background and Goal of Study: Adequate perioperative pain management leads to overall better patient outcomes¹. This research study compared adherence to the ESRA PROSPECT pain management guidelines for MS, THA & TKA in two elective care hospitals in Cork, Ireland. The primary objective was to assess if trends in perioperative adherence to international pain management guidelines translate across different procedures.

Materials and Methods: A prospective chart review was conducted on the first 41, 34 and 30 patients who had elective THA, TKA and MS respectively in June 2024. Pre-, intra- and postoperative analgesia were recorded, benchmarking against each respective PROSPECT guideline. Data were recorded and analysed using Microsoft Excel, comparing adherence across the three disciplines.

Results and Discussion: Intraoperatively, for THA & TKA, the weakest adherence were the use of dexamethasone (68.3% and 73.5% respectively) and NSAIDs/COX inhibitor (94.1% and 82.9% respectively). In terms of MS, only 1 (3.3%) patient received paracetamol/NSAID while 2 (7%) patients received magnesium sulphate, resulting in opioids being the primary choice for pain management during surgery. All MS patients received IV morphine and 28/30 (93%) received IV fentanyl. Surgical wound infiltration, dexmedetomidine and parasternal block were not utilized during any MS, whereas adductor canal/femoral nerve block was performed in 33/34 (97%) TKA patients.

Postoperatively, all THA & TKA received short acting oxycodone, while 82.9% and 79.4% received long acting oxycodone respectively. All MS received paracetamol, aspirin (NSAID) and a morphine infusion while intubated, with short acting oxycodone charted as rescue analgesia post extubation.

	Satisfactory Pre/Intra Operative Adherence	Satisfactory Postoperative Adherence	Pre/Intra-Operative: Post-Operative Ratio (number of patients:number of patients)
THA (n = 41)	51.2% (n = 21)	92.7% (n = 38)	1 : 1.81
TKA (n = 34)	55.8% (n = 19)	91.1% (n = 31)	1 : 1.63
MS (n = 30)	3.3% (n = 1)	100% (n = 30)	1:30

Conclusion(s): Post-operative adherence was higher across all three procedures. The lack of intra-operative adherence may be due to guideline unawareness, reluctancy to use new techniques such as parasternal block or distrust in non-opioid forms of analgesia, particularly in MS. To investigate this, anaesthetist attitudes to guidelines, department-wide discussions and education will be carried out, with a plan to re-audit after.

Reference:

1. Better postoperative pain management (2019) ESRA. Available at: https://esraeurope.org/prospect

10AP12-3

Takotsubo syndrome in the perioperative setting: the crucial role of POCUS in rapid diagnosis and management

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Background: Point-of-care ultrasound (POCUS) in anesthesia has grown significantly enabling rapid diagnoses and influencing clinical management in perioperative settings¹.

Stress-induced cardiomyopathy, or Takotsubo syndrome, is a rare nonischemic cardiac condition that mimics acute coronary syndrome. Surgical procedures, due to emotional and physical stress, can act as a trigger for this syndrome².

Case report: 77y female patient, ASA III, with history of atrial fibrillation, ischemic stroke 30 years prior and anxiety disorder, who underwent total thyroidectomy due to a non-toxic multinodular goiter. Prior to induction, she presented anxious with hypertension and tachycardia.

Intraoperatively there was a need of intermittent boluses of ephedrine due to hypotension, with no other events reported. Upon extubation, patient presented with shock. POCUS examination revealed severe biventricular dysfunction.

A transthoracic echocardiography confirmed right ventricular mid-distal free wall and left ventricular mid-apical akinesia with basal hypercontractility and an ejection fraction of 15% consistent with Takotsubo syndrome.

Additionally, a thrombus was identified in the right chambers, prompting administration of 5000 units of unfractionated heparin and initiation of aminergic support. EKG revealed T wave inversion in precordial and inferior leads and QTc prolongation. The patient was transferred to the coronary intensive care unit for further care. Serial echocardiograms demonstrated progressive cardiac function recovery, allowing the gradual weaning of vasopressors. Coronary angiography revealed coronary artery disease without critical ischemia confirming takotsubo syndrome diagnosis (InterTAK score 76).

Discussion: POCUS is increasingly recognized as a valuable tool in perioperative anesthesia, offering rapid diagnostic insights that guide clinical decision-making.

In this case, the use of POCUS was instrumental in identifying the underlying cause of shock and initiating appropriate treatment, including cardiac thrombus management.

References:

- 1. Byrne M, Singleton. Perioperative Point-of-Care Ultrasound. Adv Anesth. 2021;39:189–213.
- 2. Seretis K, Bounas. Takotsubo Syndrome in the Perioperative Period: A Case Report and a Comprehensive Review of Pertinent Literature. Ann Plast Surg. 2022;88(6):e33–e37.

Learning points: POCUS is a rapidly growing and impactful technique in anesthesia. Perioperative stress is an important risk factor for Takotsubo syndrome.

10AP12-4

Perioperative euglycemic diabetic ketoacidosis induced by SGLT2i: a challenging diagnosis

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Background: Euglycemic diabetic ketoacidosis (eDKA) induced by sodium-glucose co-transporter inhibitors (SGLT2i) is rare but potentially life-threatening!. SGLT2i stimulate glucagon production and inhibit renal glucose reabsorption!.

In perioperative settings, their use combined with fasting synergistically reduces glucose levels and increases ketogenesis. Failure to discontinue SGLT2i preoperatively can lead to eDKA².

Case report: A 48yo male, ASAIII, was scheduled for laparoscopic vertical gastrectomy for grade 2 obesity (BMI:38.7Kg/m²). His history included obstructive sleep apnea, and poorly controlled type 2 diabetes managed with insulin, metformin, and dapagliflozin. Surgery was under general anesthesia with desflurane.

Post-pneumoperitoneum, the patient developed persistent tachycardia (HR:-120bpm). In the PACU, he remained tachycardic, with stable blood pressure and no pain. 1h later, he developed diaphoresis and epigastric pain. EKG and cardiac markers ruled out ischemia. Shortly after, he presented with polyuria.

Arterial blood gas analysis revealed metabolic acidosis (pH:7.27, pCO $_2$:40, HCO $_3$:18, glucose:148mg/dL), with worsening acidosis in subsequent tests (pH:7.26 \rightarrow 7.25, HCO $_3$:16 \rightarrow 14), glucose consistently <200mg/dL.

Reviewing his history and medication revealed inadequate preoperative discontinuation of dapagliflozin, suggesting eDKA and urine dipstick confirmed ketonuria (>16mmol). He was treated with IV bicarbonate at 1.4%, insulin infusion with 5% dextrose and 20mEq KCI supplementation.

After 6h the metabolic acidosis was resolved. The patient was referred to diabetes care team and discharged 6 days later without complications.

Discussion: Bariatric surgery patients on SGLT2i have higher eDKA risk, with symptoms appearing from hours to weeks post-operatively². Early onset often results from delayed drug discontinuation; later cases relate to insulin withdrawal, dietary changes, or SGLT2i reintroduction.

In this case, early symptom recognition, exclusion of cardiac causes, and thorough medication review enabled timely treatment. Further studies are needed to identify other risk factors that may lead to eDKA in the perioperative period, as well as scientific evidence to support recommendations regarding the suspension time of SGLT2i².

References:

- 1. Thir. V, Perioperative diabetic ketoacidosis associated with SGLT2i: a systematic review. BrJAnaesth.2019Jul
- 2. Seki H. SGLT2i associated perioperative ketoacidosis: a systematic review. JAnesth.2023Jun

Learning points: SGLT2i should be discontinued at least 72h before surgery.

Prolonged fasting and inadequate SGLT2i discontinuation are triggers for perioperative eDKA.

10AP12-5

Enhanced recovery compared to conventional intensive care following aortic valve replacement: a retrospective analysis

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Background and Goal of Study: Enhanced recovery after cardiac surgery (ERACS) is a multidisciplinary clinical protocol comprising specific perioperative interventions that aim to reduce the surgical stress response, promote early organ function and decrease hospital length of stay (LOS). Currently there is limited evidence as to the efficacy of ERACS in the literature.

The aim of this study is to evaluate the effect of a post-anaesthesia care unit (PACU)-centric ERACS program compared to a conventional intensive care unit (ICU) program on patients undergoing aortic valve replacement (AVR) surgery.

Materials and Methods: This was a single-centre, retrospective study of patients undergoing isolated AVR surgery between 2011 and 2020. All patients had a EuroSCORE II <3 and a BMI <40. All preoperative and intraoperative care was uniform. An ERACS program was initiated in the PACU in 2011. PACU or ICU admittance was dependent on logistical factors.

Postoperative care data was compared to patients receiving conventional care in the ICU. The primary outcome was hospital LOS, with secondary outcomes including postoperative complications and removal of invasive devices such as catheters, drains and IV lines.

Results and Discussion: Overall, 751 patients were included in the study, comprising 345 with PACU-centric ERACS care and 406 with conventional ICU care, with a median [IQR] hospital LOS of 7 [6-9] and 9 [7-11] days (p<0.0001) respectively. Compared to ICU care, patients admitted in the PACU-centric ERACS program had a significantly higher risk of early discharge (hazard ratio 1.68, 95% CI: 1.46-1.92, p<0.0001).

Regression analyses demonstrated significant reductions in time to removal of invasive devices between groups (Figure). Differences in reintervention rate between groups were negligible (ICU vs ERACS; 5% vs 4%, p=0.39), as too were mortality rates (1% in both, p=0.51).

Conclusion(s): The use of a PACU-centric ERACS program significantly reduced hospital LOS and time to removal of invasive devices. We conclude that the integration of ERACS protocols into perioperative care should become standard practice in the management of AVR patient

10AP12-6

Evaluation of postoperative recovery in patients undergoing thoracic aortic aneurysm surgery: a study using Postoperative quality of Recovery Scale (PQRS)

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Background and Goal of Study: Postoperative neurological complications, including stroke and postoperative cognitive dysfunction (POCD), impair quality of life (QOL)^(f).

Total arch replacement (TAR) surgery carries a high risk of brain injury due to ischemia and inflammation⁽²⁾.

Despite cerebral protection strategies such as deep hypothermic circulatory arrest (DHCA) and selective cerebral perfusion (SCP), studies on POCD in TAR patients remain limited.

This study evaluated postoperative recovery, including cognitive function, using the Postoperative Quality of Recovery Scale (PQRS)⁽³⁾.

Materials and Methods: This study included 58 TAR patients between June and December 2016 after ethical approval and informed consent (approval no. 28-8). Exclusion criteria included prior thoracotomy, psychiatric disorders, and Mini-Mental State Examination (MMSE) scores ≤21.

PQRS assessed five domains: physiological, nociceptive, emotive, activities of daily living (ADL), and cognitive recovery. Assessments were conducted preoperatively and at 3 hours, 1 day, 3 days, and 7 days after extubation.

Results and Discussion: Of 58 patients, 24 were excluded due to incomplete data or complications, including two patients (3.4%) with delirium and one (1.7%) with stroke. The final cohort included 34 patients (median age 68.4 years, 91.2% male).

Physiological recovery reached 85.0% on day 3, reflecting effective postoperative care.

Nociceptive recovery remained below 50%, with 42.4% on day 7, indicating inadequate pain management.

Emotive recovery peaked at 94.1% on day 3, while ADL recovery improved from 7.1% on day 1 to 84.8% on day 7.

Cognitive recovery was unstable, starting at 17.6% on day 1, rising to 61.8% on day 3, but dropping to 36.4% on day 7, suggesting POCD in some patients.

The occurrences of delirium and stroke, while infrequent, emphasize the need for comprehensive perioperative neurological care to address potential impacts on recovery, particularly cognitive outcomes.

Conclusion(s): The PQRS demonstrated rapid physiological and emotive recovery but identified delays in nociceptive and cognitive recovery in TAR patients. The findings highlight the need for optimized perioperative management and further research on long-term outcomes.

References:

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- 2. Med Sci Monit, 2019; 25: 3262-3270
- 3. Anesthesiology 2010; 113:892-905

Acknowledgements: The authors have no acknowledgments to declare.

10AP12-8

Enhancing temperature management in the post-anesthesia care unit: insights from an audit

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Background and Goal of Study: Monitoring body temperature is essential for safe perioperative care, as hypothermia and hyperthermia can lead to significant complications. This audit aims to evaluate the incidence of hypothermia and hyperthermia, assess adherence to perioperative and the post-anesthesia care unit (PACU) temperature documentation, and identify areas for improvement.

Materials and Methods: The audit was conducted in January 2024 at a district hospital in Portugal. All patients undergoing surgical procedures under all types of anesthesia (other than local anesthesia) were included, except those transferred directly to the ICU or day surgery recovery phase II.

Recorded variables included demographic data, type and duration of surgical procedure and anesthesia, perioperative temperature, and values on arrival and discharge from the PACU. Body temperature was measured in the recovery room using an infrared thermometer and intraoperatively using an esophageal thermometer.

Results and Discussion: A total of 343 patients were included in the audit. Of these, 179 (52%) were male, with 49% aged between 18 and 65 years. 333 (97%) and 310 patients (90%) had temperature measured on admission and discharge from the PACU, respectively. Hypothermia, defined as a temperature below 36°C, was observed in 22 patients (6%) on arrival and in 6 patients (2%) at discharge, with the lowest recorded temperature being 35.3°C.

No patients presented with hyperthermia, defined as a temperature above 38°C, on either admission or discharge from the PACU. 88% had no intraoperative temperature record. Among the 22 patients presenting with hypothermia on admission to the PACU, 14 were female and 11 were over 65 years old.

A notable correlation was found between anesthesia duration and hypothermia incidence, with the highest rates in patients whose anesthesia exceeded 3 hours and in those receiving combined anesthesia. The audit results align with the risk factors for perioperative hypothermia identified in the literature.

Conclusion: Temperature is grossly under-monitored perioperatively, as demonstrated by our audit, despite the association of numerous adverse events.

Our findings highlight the need for system-level changes to enable proactive temperature monitoring and documentation throughout all phases of perioperative care to enhance patient outcomes.

10AP12-9

The importance of calcium release-activated calcium channels in inhibitory neurons for perioperative neurocognitive disorders

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Background and Goal of Study: Perioperative neurocognitive disorders (PND) are serious complications in current perioperative practice, with general anaesthesia playing a major role in their onset. Disruption of neuronal calcium homeostasis, potentially involving calcium release-activated calcium (CRAC) channels, has been proposed as one of the underlying mechanisms.

The study aimed to investigate the role of CRAC channels in inhibitory neurons in the development of PND using a knockout (KO) mouse model.

Materials and Methods: We genetically deleted the channel pore protein in inhibitory interneurons and compared behavioural data between wild-type (WT) and KO mice before and 1h after exposure to general anaesthesia (1 minimum alveolar concentration for 30 min). Electrophysiological experiments were conducted using hippocampal slices to examine the underlying mechanisms.

Results and Discussion: In the Y-maze test, WT mice showed a significant reduction in success rates following sevoflurane anaesthesia (p < 0.001), whereas no significant reduction was observed in KO mice (p=0.1).

These findings were consistent with results under isoflurane or extended sevoflurane anaesthesia (1 h). Similarly, hippocampal long-term potentiation (LTP) was significantly reduced in WT mice after sevoflurane exposure (p < 0.001) but not in KO mice (p=0.2).

Whole-cell patch-clamp recordings from CA1 interneurons revealed a sevoflurane-induced increase in the frequency of spontaneous inhibitory postsynaptic currents in WT mice, which was not observed in KO mice. This frequency increase in WT mice was suppressed by tetrodotoxin, indicating that it was action potential dependent.

Furthermore, pharmacological inhibition of CRAC channels in WT mice prior to anaesthesia resulted in similar improvements in the Y-maze test following sevoflurane exposure.

Conclusion(s): CRAC channels in inhibitory interneurons may play a critical role in the development of PND. These channels appear to regulate the excitatory/inhibitory activity balance by controlling anaesthesia-induced action potentials, potentially contributing to LTP suppression.

10AP12-10

Analgesia in minimally invasive esophagectomy: a case series

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Background: Thoracic epidural analgesia (TEA) remains the gold standard for perioperative pain management in open esophagectomy. However, in minimally invasive esophagectomy (MIE), fascial plane blocks, such as the erector spinae plane block (ESPB), offer a potentially effective and safer alternative.

Case report: We reviewed several cases of patients who underwent MIE at our center between January 2022 and June 2024. Variables analyzed included the analgesic technique employed, pain control during the first 3 postoperative days (POD), postoperative opioid consumption, vasoactive drug (VAD) requirements, postoperative complications, and length of ICU and hospital stays. Pain control was categorized using subjective assessments documented in electronic medical records and simplified into the following scale:

• 1 (good control): VAS 1-3

• 2 (moderate control): VAS 4-6

• 3 (poor control): VAS 7-10

Discussion: 24 patients were included, with 4 excluded due to ICU intubation.

Analgesic Technique	Number of Pati- ents	ASA	POD 1	POD 2	POD 3	Postope- rative Opioids	VAD	Postope- rative Complica- tions	UCI Stay	Hos- pital Stay
IV Anal- gesia	11	2,45	1,45	1,27	1,09	3/11 (27%)	2/11 (18%)	4/11 (36%)	6,45	20,27
TEA	6	2,66	1,67	1,33	1	2/6 (33%)	1/6 (17%)	1/6 (17%)	3	14
ESPB	3	2	1	1	1	1/3 (33%)	0/3 (0%)	1/3 (33%)	2,33	13,33

- IV Analgesia: The most commonly used technique, despite
 not being the standard. Pain control was comparable to other
 methods. ICU and hospital stays were longer, likely due to a
 higher number of postoperative complications.
- TEA: This approach demonstrated poorer pain control in the early postoperative period. TEA has a failure rate of up to 12%, primarily due to catheter misplacement or suboptimal dosing. It carries risks associated with insertion and potential adverse effects, including hypotension and urinary retention (1).
- ESPB: Although limited to a small sample size (n = 3), ESPB provided the best pain control during the first 3 PODs, comparable opioid consumption, reduced VAD requirements, and no significant differences in anastomotic leak rates or ICU/hospital stays. These findings align with prior studies (2).

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Learning points:

- ESPB represents a promising option for perioperative pain management in MIE.
- Larger randomized controlled trials are required to establish the optimal analgesic strategy for MIE.

10AP12-12

Assessing the impact of pre-assessment communication on elective surgery outcomes in a district general hospital

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Background and Goal of Study: Providing high-quality, evidence-based information empowers patients, helping them understand their treatment and associated processes. Studies, including the Sprint National Anaesthesia Project (SNAP-1), highlighted anxiety as a significant concern for patients undergoing surgery. Clear, well-written information can alleviate anxiety, set realistic expectations, and improve patient satisfaction.

This audit was undertaken at QEH London, aimed to Identify the adequacy of information provided to patients during pre-assessment and assess patient comprehension/satisfaction.

Materials and Methods: A total of 50 patients included in this audit and questionnaire consisting of six questions was given to patients undergoing elective surgeries at two time points: before they met the anaesthetist on the day of surgery and postoperatively before discharge. CEPOD cases and obstetric patients were excluded from this study.

Results and Discussion: Before surgery, 14% of patients felt they did not receive adequate explanations regarding anaesthesia choices, which improved to 100% after seeing the anaesthetist. One fourth of patients initially did not understand the side effects of the anaesthetic procedure (this improved to 98% post-consultation).

Majority of patients understood the side effects of pain relief. Only 16% of patients reported not receiving any written or online information regarding the risks and side effects of anaesthesia. Documentation of conversations between nurses or anaesthetists regarding risks and side effects was completed 100% of the time.

Conclusion(s): This audit underscores the importance of clear, thorough communication during the pre-assessment process in enhancing patient understanding, reducing anxiety, and improving satisfaction. The development of concise and informative patient leaflets for Pre-assessment Clinic (PAC) visits for patients could be helpful.

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10AP13-1

Identifying patient-related factors for respiratory complications during deep sedation catheter ablations in patients with atrial fibrillation: a single centre retrospective study

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Background and Goal of Study: Catheter ablations (CA) in patients with atrial fibrillation (AF) are performed either under procedural sedation and analgesia (PSA) or under general anaesthesia (GA). Patient selection is needed to outweigh the risk benefits related to PSA as compared to GA.

The identification of patient-related factors, in particular in view of respiratory complications during moderate or deep sedation, is known to be very limited.

The aim of this study was to identify predictive factors for development of per-procedural respiratory complications.

Materials and Methods: This single center retrospective cohort study was conducted in a tertiary teaching hospital in The Netherlands from October 2020 and July 2023. It involved adult, consecutive patients for a CA under PSA for AF. The ISOLATION cohort study and ISOLATION 'light' registry were approved by the ethical review boards MUMC⁺ (METC numbers 19-052 and 2019 1022).

This study was conducted in compliance with the Declaration of Helsinki and the Good Clinical Practice guidelines. Per-procedural respiratory complications were defined as the use oral/nasal airway, or an indication for a non-rebreathing mask or high flow oxygen, or a hypoxemic event (a saturation <90% ≥120 seconds) or a conversion to GA with laryngeal mask airway (LMA) or tracheal intubation.

Results and Discussion: A longer sedation duration (OR 1.01 per minute, 95%CI: 0.99-1.00, p-value 0.006) was associated with respiratory complications. Patient factors as a higher percentage of visceral fat (OR 1.11 per percentage, 95%CI: 0.86-0.97, p-value 0.004), a higher Body Mass Index (BMI) (OR 1.12 per point, 95%CI: 1.03-1.23, p-value 0.01), an age >50 years (OR 3.99, 95%CI: 1.27-17.6, p-value 0.03) and a neck circumference > 40cm (OR 2.01, 95%CI: 1.14-3.58, p-value 0.02) resulted in a significant increase of respiratory complications.

The multiple logistic regression model included sedation duration, an age > 50 years, a neck circumference >40cm, visceral fat percentage, tiredness, apnea-hypopnea-index (AHI), the diagnoses obstructive sleep apnea syndrome (OSAS) and chronic obstructive pulmonary disease (COPD) The AUROC of the model with all retained variables was 0.72, 95% CI: 0.65-0.78.

Although the retrospective design of the study might affect the generalizability of the outcome, our results reveal possible predictors for respiratory complications for PSA in CA.

Nevertheless it is obvious that a follow-up study based on a prospective design is needed to further optimize and validate the prediction model.

Conclusion: Predictive patients characteristics factors for development of per-procedural respiratory complications were identified and included an age > 50 years, a neck circumference >40cm, visceral fat percentage, tiredness, AHI and a medical history of OSAS and COPD. An important procedure related predictive factor is the duration of the PSA.

10AP13-2 Multifactorial non-traumatic compartment syndrome: a rare postoperative case

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Background: Acute compartment syndrome (ACS) occurs when increased pressure in an osteofascial compartment impairs tissue perfusion, causing irreversible damage to muscles and nerves. While usually linked to trauma, rare non-traumatic cases may result from factors like prolonged surgical positioning, blood loss, vascular insufficiency and intraoperative hypotension.

Case Report: A 39yo male with obesity, hepatic steatosis and prior right femoral subtrochanteric fracture repair underwent a 6h procedure for osteosynthesis revision and bone graft application. The procedure was performed under general anesthesia and femoral and lateral femoral cutaneous nerve block, with standard ASA monitoring, processed EEG, neuromuscular monitoring and invasive blood pressure.

The patient was supine, with the right leg tractioned and the left elevated with gel padding underneath his calves. He remained hemodynamically stable throughout the procedure. Estimated blood loss was 1L.

2 hours postoperatively, he developed left leg pain and tense calf sweling. Doppler ultrasound excluded deep vein thrombosis. Symptoms progressed with severe pain and paresthesia with preserved pulses.

Analytically, with acute kidney injury and rabdomyolisis. Intracompartmental pressures confirmed ACS, requiring urgent fasciotomy. Postoperative recovery was uneventful, with symptom resolution.

Discussion: This case highlights the multifactorial nature of non-traumatic ACS, with contributing factors including limb elevation, compression, prolonged immobility/surgical positioning and blood loss. Young males are more predisposed to ACS due to greater muscle mass. Non-traumatic ACS presents diagnostic challenges, as symptoms may mimic deep vein thrombosis or ischemia. Early pressure measurement is critical for timely diagnosis. Preventive strategies, such as intraoperative limb mobilization and adequate blood pressure are essential during prolonged surgering.

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Learning Points:

- 1. Non-traumatic ACS can result from prolonged positioning, compression, and blood loss during surgery.
- 2. Preventive strategies, including intraoperative limb mobilization, may reduce ACS risk.
- 3. Early diagnosis and fasciotomy are crucial to avoid irreversible complications.

10AP13-3

Airway warming devices and associated warming strategies for preventing intraoperative hypothermia: a systematic review and network meta-analysis

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Background and Goal of Study: Preventing intraoperative hypothermia is an essential element of improving the quality of perioperative care. Active airway warming via heated humidifier (HH) has beneficial effect in maintaining the intraoperative core temperature and supports respiratory physiology during general anesthesia.

However, considering that respiratory heat loss is relatively limited, the application of HH alone may be insufficient to prevent hypothermia, and combining it with other warming devices would be more effective.

Therefore, we performed a network meta-analysis (NMA) to assess the relative efficacy of airway warming devices and associated warming strategies to prevent intraoperative hypothermia.

Materials and Methods: We searched MEDLINE, Embase, CENTRAL, and Google Scholar to identify all randomized controlled trials (RCTs) up to September 2024 that compared the effects of two or more warming strategies especially including airway warming devices in preventing hypothermia in patients under general anesthesia.

The primary outcome was the intraoperative core temperature at the end of surgery. We performed both frequentist and Bayesian NMA and used the surface under the cumulative ranking curve (SUCRA) values to establish a rank order of the warming strategies evaluated.

Results and Discussion: A total of 25 RCTs involving 1404 patients were included in the systematic review and NMA. At the end of surgery, HH, HH + intravenous fluid warmer (IV), HH + IV + water mattress, and the Mega Acer Kit (MAK), which combines an heated-humidified breathing circuit with a fluid warming device, showed significantly higher core temperature than the control. According to the SUCRA values, the core temperature at the end of surgery was highest in MAK, followed by HH + IV + WM, heat and moisture exchanger (HME) + passive insulation + IV, and HME + forced air warmer.

MAK also had the highest SUCRA value for intraoperative core temperature at all other analyzed time points. The SUCRA values from the Bayesian model were similar to those from the frequentist model, demonstrating the robustness of our analysis. Howev-

er, due to the limited quality and quantity of the evidence involved, additional studies are needed to ascertain the relative effects of the various warming strategies.

Conclusion(s): MAK was most effective in preventing intraoperative hypothermia among various warming strategies involving airway warming devices in patients under general anesthesia.

10AP13-4

Prediction of Perioperative Myocardial Injury with the Surgical Apgar Score in non-cardiac high-risk surgery

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Background and Goal of Study: Perioperative myocardial injury after non-cardiac surgery (PMI) is a postoperative troponin (TnT) increase¹ and associated with higher 30-day morbidity and mortality. This study aimed to investigate whether the Surgical Apgar Score (SAS) can predict PMI in non-cardiac high-risk surgery. The SAS assigns points based on intraoperative maximum or minimum of hypotension, blood loss and tachycardia², which are associated with PMI.

Materials and Methods: After ethics approval, a perioperative database with prospective data collection in non-cardiac highrisk surgical patients (ASA status > II or cardiac high-risk procedure) with at least two perioperative high-sensitive TnT (hsTnT) values was prospectively set up [3]. The database includes 1473 patients for whom the primary endpoint, incidence of PMI, was determined based on a difference between pre- and postoperative TnT values (Δ hsTnT > 14 ng/I). SAS quality and its combination with other preoperative scores (RCRI, ASA, POSPOM, CCI, Orion) were evaluated with AUROC and AUPR curves.

Results and Discussion: 222 patients (15.1%) developed PMI. Compared to the cohort without PMI, patients with PMI were older, had higher prevalence of prior cardiovascular disease, were more often ASA class IV/V (3.6% vs. 8.1%, P=0.030), and to undergo high cardiovascular risk surgery more frequently (49.5% vs. 59.9%, P=0.017). PMI occurred more often in thoracic interventions (9.0% vs 6.3%, P<0.001). The SAS was lower in the PMI group (5 [4;7] vs. 6 [5;7], P<0.001) and predicted PMI incidence with an AUROC of 0.630 [0.539 to 0.721]. Combining the SAS with preoperative risk scores did not improve PMI prediction (Table 1).

	RCRI & SAS	ASA & SAS	CCI & SAS	POSPOM & SAS	ORION & SAS
AUROC	0.626	0.611	0.631	0.639	0.662
	[0.535 to 0.717]	[0.518 to 0.705]	[0.541 to 0.722]	[0.551 to 0.727]	[0.578 to 0.745]
AUPR	0.244	0.223	0.269	0.249	0.284
	[0.199 to 0.297]	[0 179 to 0 274]	[0.222 to 0.323]	[0.203 to 0.301]	[0.235 to 0.338]

Table 1: Predictive performance of combined perioperative risk scores for PMI.

Limitations: Most PMI were diagnosed within 24 hours due to frequent blood sampling during this period, potentially overlooking PMI occurring later.

Conclusion: Our study suggests that SAS is not a useful predictive score for PMI, whether alone or combined with commonly used preoperative risk scores. Further studies are needed to allow prediction of PMI based on pre- and intraoperative parameters.

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10AP13-5

Efficacy and safety of intrathecal morphine in major abdominal surgery: do peripheral nerve blocks add value?

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Background and Goal of Study: Intrathecal morphine (ITM) provides effective pain control in major abdominal surgeries but is associated with dose-dependent respiratory depression.

Our study compares pain scores, opioid use, and respiratory depression among patients receiving standard care (SC), ITM, peripheral nerve blocks (PNB), or ITM + PNB.

Materials and Methods: A retrospective analysis of patients undergoing major abdominal surgeries (e.g., hepatic, pancreatic) was conducted. Patients were divided into 4 groups: SC, SC + PNB, SC + ITM, and SC + ITM + PNB. Pain scores (Numeric Pain Rating Scale - NRS), opioid use (Oral Morphine Milligram Equivalent - MME), and respiratory depression episodes (Respiratory Rate <6) during the first 24 hours in the post-anesthesia care unit were collected.

Results and Discussion: 319 patients were observed. ITM, with or without PNB, resulted in significantly lower pain scores and opioid use compared to SC or PNB alone. Median NRS was 4 (IQR: 2–5) for ITM, 4 (IQR: 1–6) for ITM + PNB, versus 6 (IQR: 5–7) for SC and 6 (IQR: 3–7) for SC+ PNB (p < 0.001).

Median oral MME was 20 (IQR: 14–40) for ITM and 20 (IQR: 5–36) for ITM + PNB, compared to 50 (IQR: 30–55) for SC and 43 (IQR: 30–58) for SC+ PNB (ρ < 0.001). PNB alone offered no significant pain relief over SC.

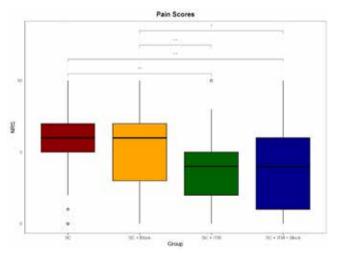


Figure.

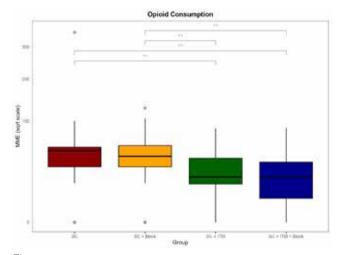


Figure.

Respiratory outcomes were similar across groups; the median number of respiratory depression episodes was zero. BMI and OSA were identified as predictors of desaturation , but ITM was not linked to increased respiratory depression.

Conclusion(s): ITM was highly effective in reducing pain and opioid use compared to SC or PNB alone, with no increase in respiratory risks. Adding PNB to ITM did not significantly improve pain relief. These findings suggest ITM is sufficient for effective pain control in major abdominal surgeries, supporting its use as a safe analgesic approach.

10AP13-6 Perioperative management of a patient with hemophilia A with inhibitors to Factor VIII: a case report

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Background: Haemophilia A (HA) is a rare X-linked recessive disorder caused by a deficiency of coagulation factor VIII (FVIII), leading to impaired clotting.¹ Severe cases, defined by FVIII levels below 1%, are associated with higher bleeding risks.¹ Some patients develop FVIII inhibitors, antibodies that further complicate management by increasing bleeding risk and reducing the efficacy of FVIII replacement therapy², requiring agents like activated prothrombin complex concentrate or recombinant activated factor VII (rFVIIa).¹²

Preoperative planning requires inhibitor screening, evaluation of bleeding and thrombosis risks, and medication review. 2

Collaborative efforts are essential to optimize outcomes.^{1,2}

Case report: A 76-year-old male, ASA III, with severe HA (FVIII < 0.5%), an FVIII inhibitor (11.14 UB), reduced mobility from haemophilic arthropathy, and hepatitis C proposed for unilateral cataract surgery. Despite the procedure's low bleeding risk, the patient required meticulous perioperative management. After pre-anesthetic and coagulopathy consultations it was decided to administer prophylactic rFVIIa before surgery. Close perioperative monitoring for bleeding and thrombosis was planned.

Discussion: This case illustrates the challenges of managing severe HA with inhibitors in the perioperative setting. Despite the low bleeding risk, comprehensive preparation was essential. Key aspects included coordination among anesthesiology, hematology, and ophthalmology teams; thorough preoperative assessment of bleeding, thrombosis, comorbidities, and therapies; and hemostatic management with rFVIIa, ensuring bleeding control without excessive thrombotic risk.

This case highlights the importance of individualized perioperative planning for hemophilic patients with inhibitors and provides a model for similar cases.

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Learning points: The perioperative management of HA patients with inhibitors requires careful planning, risk assessment, and interdisciplinary communication. Individualized hemostatic strategies are critical even for low-risk procedures to ensure safety and optimal outcomes.

10AP13-7

Surgery cancellation rate after visiting preanesthetic evaluation Clinic Khon Kaen Hospital

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Background and Goal of Study: The Pre-anesthetic Evaluation Clinic at Khon Kaen Hospital has been established since 2019, to evaluate patients with comorbidity prior to surgery. The benefit to this clinic has not been evaluated previously.

Objective: To evaluate the rate of surgical cancellation in patients visiting the pre-anesthetic evaluation clinic before surgery.

Materials and Methods: After the ethical committee's approval, the retrospective descriptive study was conducted from October 1, 2021 to September 30, 2022. The pre-anesthetic evaluation form, anesthesia record and medical record of patients who underwent non-cardiac surgery were reviewed after visiting the pre-anesthetic evaluation clinic. Demographic data, underlying disease, surgical cancellation on surgery day and reasons were recorded.

Results and Discussion: 2,701 cases were included. Surgery for 115 patients was cancelled due to the patient's status changed 52.2% (60 patients), treatment plan changed 15.6% (18 patients), patient refusal 12.2 % (14 patients), further investigation or consultation needed 5.2 % (6 patients) and others 14.8% (17 patients).

The 14 patients out of patient's status change were the COVID-19 infection. The cancellation rate on surgery day was 4.3 %.

Conclusion(s): Even though the surgical cancellation of the preanesthetic evaluation clinic patient visit prior to surgery was quite low, the additional improvements can be made by correcting preventable cancellation reasons.

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10AP13-9

Cardiopulmonary resuscitation in prone position during bone cement-augmented pedicle screw instrumentation in complex spine surgery: a rare presentation of sudden hypotension and Bezold-Jarisch vasovagal reflex

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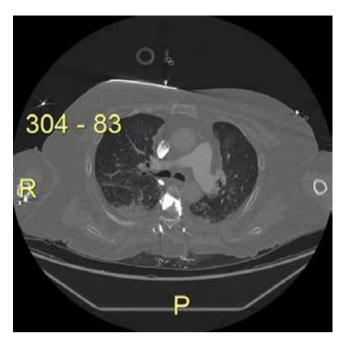
Background: Bone cement implantation syndrome (BCIS) related to polymethylmethacrylate (PMMA) in complex spine surgeries is rare¹. While vascular cement leakage occurs in -9% of cases involving cement-augmented pedicle screw instrumentation (CAPSI), BCIS symptoms are uncommon, with an incidence of 0.2%–1.4% .93% of leaks are perivertebral and asymptomatic². This report describes a severe BCIS case necessitating cardiopulmonary resuscitation (CPR) in the prone position during spine surgery.

Case report: A 76 y.o hypertensive woman(BMI 31.5) with severe osteoporosis and multiple comorbidities underwent thoracolumbar CAPSI. Anesthesia was managed using total intravenous opioid-free anesthesia. During thoracic PMMA cementation, she developed sudden hypoxemia, hypotension, and asystole.

Advanced CPR in prone restored circulation. TEE showed no features of VD dilatation or dysfunction. CT angiography revealed PMMA leakage into intrathoracic veins but no conclusive image of pulmonary embolism (PE). Post-surgery,she recovered in the ICU. One year follow-up, she was fully able to walk and pain-free.

Discussion: BCIS pathophysiology involves mechanical embolization and vasodilatory immunohumoral responses to PMMA. Contributing factors include severe osteoporosis, rheumatic arthritis, extensive screw placement, and prior PMMA exposure. Sudden vasoplegia and Bezold-Jarisch vasovagal reflex can explain the symtoms with no evidence of severe PE.

This case highlights the importance of identifying BCIS risk factors, particularly in spine surgeries involving cement augmentation to reduce complications.



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Learning points: This case underscores the complexity of BCIS in spine surgeries with CAPSI. Sudden vasoplegia and bradycardia progressing to asystole were likely due to hypersensitivity to polymethylmethacrylate (PMMA), triggering immunological vasodilation and a vasovagal response via the Bezold-Jarisch reflex.

10AP13-10

Evaluation of modified early warning score (MEWS) in Perioperative Medicine: A Pilot Study in a French Military Teaching Hospital

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Background and Goal of Study: The Modified Early Warning Score (MEWS) (1-3) is a is a simple bedside scoring system used to identify clinical deterioration. Yet its application in perioperative medicine remains underexplored. This pilot study aims to describe the implementation of MEWS-based surveillance in perioperative care, focusing on its role in early detection and management of complications.

Materials and Methods: We conducted a retrospective, singlecenter study at a French military teaching hospital, using a database comprising data from 3,968 patients and 59,087 MEWS measurements, covering the period from April 2021 to September 2024. The study focused on postoperative monitoring using the MEWS to assess its impact on patient outcomes in thoracic, visceral, and gastrointestinal surgical units.

Results and Discussion: Out of the 3,968 patients, 99 (2.5%) required unscheduled intensive care unit (ICU) admissions. The MEWS score distribution was as follows: score 0 (46.7%), score

1 (30.5%), score 2 (13.2%), score 3 (5.7%), score 4 (2.3%), and scores >4 (1.6%). Patients with a MEWS score >4 were flagged for immediate medical assessment.

Conclusion(s): Our results suggest that in perioperative period the majority of patients had low MEWS scores, while higher scores were less frequent but potentially associated with the need for ICU care. The MEWS score could be a useful tool for triaging patients in perioperative medicine. It may help identify patients at risk of deterioration, potentially reducing non-scheduled ICU admissions or allowing for earlier and more appropriate intensive care intervention.

However, further research would be needed to confirm these findings and better understand the clinical benefits of routine MEWS monitoring in this setting.

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10AP13-11 Magnesium sulphate: a game changer in postoperative analgesia

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Background and Goal of Study: In bariatric surgery, opioid-free analgesia and reduction of post-operative complications are critical. This study evaluated the efficacy of intraoperative magnesium sulphate (MgSO₄) compared to its use exclusively in the Post- Anaesthesia Care Unit (PACU) and the absence of its use. The primary endpoint was pain intensity at PACU admission. Secondary endpoints included pain at PACU discharge, at 6, 12, and 24 hours postoperatively, and the incidence of overall and pain-related complications.

Materials and Methods: This retrospective study analysed 324 patients who underwent bariatric surgery between 01/2023 and06/2024. Patients with incomplete records were excluded. Non-parametric tests (Kruskal-Wallis and Dunn) assessed differences in pain scores, while logistic regression evaluated complications. Sociodemographic variables, comorbidities, and concurrent analgesics were examined.

Results and Discussion: Patients receiving intraoperative $MgSO_4$ reported the lowest pain scores at PACU admission (1.29±1.62) compared to PACU-only administration (1.96±1.65; p=0.0073). Pain at PACU discharge was similarly low across all groups (p=0.259) - in the PACU- only group, there was asignificant reduc-

tion in pain from admission to discharge (p=9.16x10-7). However, patients receiving MgSO₄ onlyin the PACU required more ketamine than the ones receiving it intraoperatively.

No significant differences were observed between groups in nonpain-related or overall complications (p>0.9). Pain-related complications were fewer in the MgSO₄- using groups (<3%) compared to the non-magnesium group (6.9%).

The analysis confirmed no confounding effects of intraoperative analgesics or sociodemographic differences.

These findings underscore the efficacy of this drug, particularly used intraoperatively, its safety regarding postoperative complications, and the importance of further research into its role in multimodalanalgesia and potential to minimise opioid use and complications.

10AP13-12

Intraoperative EEG reflects the stress-reducing effects of audiovisual sedation, showing its comparability to conventional propofol sedation in regional anesthesia

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Surgery using regional nerve blocks allows for safe and cost-effective procedures while avoiding the risks commonly associated with general anesthesia. Still, many patients opt for a light propofol sedation to mitigate perioperative anxiety.

We hypothesized that utilizing immersive video glasses to calm patients as a form of non-pharmacological sedation is comparable in its anxiety and stress-reducing effects.

We analyzed preliminary data from 90 patients undergoing surgery with regional anesthesia. Subjects were assigned to either the control group receiving propofol or the intervention group receiving video glasses for sedation.

We evaluated physiological markers (frontal EEG low/high beta ratio) and subjective measures (Hospital Anxiety and Depression Scale, HADS; Positive and Negative Affect Schedule: Negative Affect, PANAS NA) as indicators of stress and anxiety.

For comparison, the beta ratio and the relative change between pre-and post-surgery questionnaire scores were calculated, and we performed the Mann-Whitney-U- and the Wilcoxon-Signed-Rank-Test and computed the complementing effect sizes Cohen's d and Cohen's U3.

The EEG analysis depicted in Figure 1A demonstrated a significant increase and small effect in the beta ratio in the intervention group over the first 40 minutes (p= 0.036; Cohen's U3, 0.58 [0.32 0.74]), which correlates with relaxation and reduced anxiety.

This reduction was also present in self-reported anxiety and stress levels after surgery, with a statistically significant decrease in the intervention group (HADS: p<0.001; PANAS NA: p<0.001) and the control group (HADS: p<0.001; PANAS NA: p<0.001). As shown in Figure 1B and C, no significant differences and only small effects were found in the relative changes between the

groups (HADS: p = 0.3118, Cohen's d, -0.19 [-0.62 0.24]; PANAS NA: p = 0.328, Cohen's d, -0.22 [-0.65 0.21]).

Subjective stress and anxiety significantly decreased in both groups; the increase in relaxation-related brain activity further supported the success of audiovisual sedation. These results show similar outcomes and present audiovisual sedation as a promising alternative for clinical use.

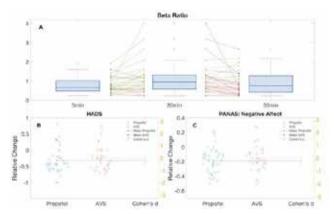


Figure 1.

11AP10-6

Anaesthetist-led perioperative transthoracic echocardiography service - a clinical audit

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Background and Goal of Study: The growing enthusiasm for transthoracic echocardiography (TTE) among non-cardiac specialties has led to development of a number of focused TTE protocols. In Hong Kong, anaesthetist-led perioperative echocardiography clinic is gaining popularity and rapidly developing. Our hospital is one of the first in the territory to establish an anaesthetist-led TTE service, with a primary aim of fast-tracking patients who require focused TTE in the perioperative period. This audit aims to assess whether TTEs done by anaesthetists are of comparable standard as formal TTEs done by cardiologists.

Materials and Methods: Data were collected from the past 5 years (November 2019-October 2024). All patients who have attended the anaesthetist-led TTE clinic from the period were traced on the electronic patient record(CMS). Focused TTEs done by anaesthetists with formal or so-called "full" TTEs (performed or reported by cardiologists) within the 1-year timeframe were included in order to assess the agreement (or concordance). A total of 405 patients were traced and 34 patients met the set criteria. Cohen's kappa analysis is used to measure inter-observer agreeability for binary/categorical variables e.g. presence of valve pathology, while Bland-Altman plot and Intraclass correlation coefficients (ICC) are used for continuous data.

Out of all the measurements in the TTE studies, left ventricular ejection function (LVEF) and the presence of any stenotic valvular pathologies especially mitral or aortic stenosis are of clinical significance perioperatively.

Results and Discussion: 20 male/14 female patients with average age of 71 (33-91) were examined. There was good agreement for LVEF with little to no systematic bias (ICC 0.61, p<0.001). The

Cohen's Kappa for diagnosing mitral stenosis (κ = 1, p<0.001) and aortic stenosis (κ = 0.87, p<0.001) showed that there was excellent agreement.

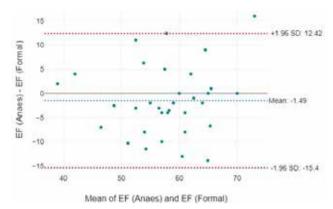


Figure. Bland-Altman plot for left ventricular ejection fraction (LVEF) measurement between TTE done by anaesthetists and by cardiologists.

Conclusion(s): There was a high agreement between TTE done by anaesthetists and by cardiologists for clinically significant cardiac conditions perioperatively.

Reference:

Ranganathan, Priya et al. Perspectives in clinical research vol. 8,4 (2017): 187-191

11AP10-7

Severe intraoperative hypertension due to unknown ectopic pheochromocytoma surgical removal

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Background: Pheochromocytomas are rare endocrine tumors, secreting large amounts of endogenic catecholamines. We reported a 63-year-old woman undergoing unknown ectopic pheochromocytoma surgical removal.

Case Report: A 63-year-old woman with type II diabetes and hypertension was scheduled for surgery to remove a giant intraabdominal tumor of unknown origin. Angio CT revealed a 12.3 x 10.7 cm heterogeneous mass in the hepatic hilum, suggesting an abscess or hydatid cyst. MRI suggested a benign tumor. Preoperative tumor markers were elevated (AFP: 33.81 ng/ml, CEA: 14.5 ng/ml), but serological tests for Echinococcus antibodies were negative.

The patient, classified as ASA 2, underwent preoperative evaluation revealing hypertension and mild palpitations, but no arrhythmias. Standard monitoring was supplemented with central venous and radial artery cannulation. Severe hypertension (200/130 mmHg) was noted initially, decreasing to 145/95 mmHg after induction.

During surgery, exposure attempts led to severe hypertension and tachycardia (270/150 mmHg) with bilateral mydriasis. Hypertension was managed with deepened anesthesia, nitroglycerin, and nicardipine. The lowest recorded blood pressure was 150/70

mmHg. After tumor removal, hypotension required noradrenaline. A postoperative brain CT was normal. The patient was extubated one hour after surgery with no neurological deficits. Noradrenaline was discontinued after 12 hours, and the patient remained stable (120-140/65-78 mmHg, sinus rhythm). She was transferred to the ward on the second postoperative day and referred to an endocrinologist for further care

Discussion: Unknown pheochromocytomas are rare, but with increased perioperative mortality. The patient was scheduled for intraabdominal tumor removal but resulted intraoperatively to be clinically pheochromocytoma. The pathology report confirmed the diagnosis. Adequate monitoring and good communication with surgeons can guarantee success and patient safety.

References:

- 1. R. Domi et al. Anesthetic considerations on adrenal gland surgery. J Clin Med Res 2015
- 2. DiMaria CN, Rasquin LI, Hung Pinto WA. The Highs and Lows of an Unknown Pheochromocytoma in an Elderly Patient. Case Rep Endocrinol. 2019; 2019:5707968.

Learning Points:

- 1. A thorough preoperative evaluation is essential to identify potential signs of undiagnosed pheochromocytoma.
- 2. Close intraoperative collaboration with the surgical team is crucial.

11AP10-8

Impact of intravenous iron administration to patients with iron deficiency anemia before major abdominopelvic cancer surgery

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Background and Goal of Study: Perioperative iron deficiency anemia (IDA) is associated with significant morbidity. Delta-hemoglobin (Δ Hb), defined by the difference between preoperative and discharge hemoglobin values, is described in the literature and seems associated with postoperative outcomes. Discharge anemia in cancer patients can limit tolerance to further cancer therapies.

This study aims to test the variation in ΔHb according to intravenous iron administration in patients with IDA having major abdominopelvic cancer surgery.

Materials and Methods: We included retrospectively adult patients with abdominopelvic cancer and preoperative IDA who had undergone major surgery for tumor resection between September 2019 and August 2022. Anemia was defined as hemoglobin<12g/dL, and iron deficiency as ferritin<100 ng/mL or ferritin<300 ng/ml with transferrin saturation coefficient<20%. Participants received 1g intravenous ferric carboxymaltose at least 7 days before the procedure (D-7 group), or upon admission the day before the surgery (D-1 group), or did not receive any intravenous iron (control group). The primary endpoint was ΔHb defined by the difference of hemoglobin level between preoperative and discharge values. A multivariable analysis was conducted using a linear regression model to analyze ΔHb according to iron supplementation group, blood loss and blood transfusion. Secondary endpoints were blood transfusion and postoperative complications (Clavien-Dindo classification).

Results and Discussion: 99 patients were included: 36 patients in D-7 group, 29 in D-1 group and 34 in control group. There was a significant difference in Δ Hb between the group receiving intravenous iron (D-7 and D-1, mean Δ Hb=0.34) and the untreated group (control, mean Δ Hb=0.97) with a p-value=0.036. No difference in Δ Hb between D-7 and D-1 groups.

In multivariable analysis, blood loss, transfusion, and intravenous iron were independently associated with changes in Δ Hb (p-value=0.011, 0.004, 0.013, respectively). Secondary endpoints were all non-statistically different.

Conclusion(s): Preoperative administration of intravenous iron in patients with IDA before major abdominopelvic cancer surgery was associated with reduced delta hemoglobin from the preoperative value to that at discharge.

Reference:

Threshold heterogeneity of perioperative hemoglobin drop for acute kidney injury after noncardiac surgery: a propensity score weighting analysis. BMC Nephrol 2022

General Anaesthesiology

11AP01-1

Interdisciplinary action of an anaesthesiologist: a case report of an active oropharyngeal bleeding with no identified focus

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The anaesthesiologist plays a fundamental role in promoting the best surgical outcome for the patient. We present a clinical report of an active bleeding patient and the multidisciplinary approach necessary to identify its source.

A 72-year-old male patient with a personal history of peripheral arterial disease, dyslipidemia, smoking, and an aorto-bifemoral bypass surgery. He presented at the Emergency Department with an acute ischaemia of the right lower limb, grade Ilb, and underwent a thromboembolectomy of the bypass right branch.

An intravenous general anaesthesia was performed, with placement of an i-Gel® 4. Preoperative haemoglobin was 14.4g/dl, blood loss was 600ml and no surgical complications arose. During the emergence from anaesthesia, a large oropharyngeal bleeding was noted, with no identified focus. A bolus of vasopressors was needed due to transient hypotension.

Re-induction of anaesthesia and orotracheal intubation were performed, followed by bronchofibroscopy, which excluded the presence of blood in the trachea. Gastric aspiration of 400ml of blood. The upper GI endoscopy showed a large, fresh, adherent clot occluding the duodenum lumen.

A review of the CT scan previously obtained led to the suspicion of an aorto-enteric fistula and the patient underwent percutaneous aortic expander placement. Anticoagulation was reversed with protamine sulfate (aPTT ratio 2.94) and tranexamic acid was given. Due to a revised haemoglobin of 9.2g/dl and 1.16 aPTT ratio, it was requested 1 unit of RBCs and fresh frozen plasma. No further need for vasopressors.

The patient was admitted to the ICU, sedated and mechanically ventilated. Postoperative lactate levels peaked at 2.1mmol/L and then steadily decreased.

Four re-interventions were required due to rethrombosis of the branch in the context of septic shock, including a bi-axillary bifemoral bypass and D4 duodenal resection, culminating in a transfemoral amputation because of irreversible right inferior limb ischaemia. After a 94-day hospitalization, the patient was discharged to a Rehabilitation Unit.

Anaesthesiology focuses on patient safety in the perioperative period. This case highlights the diagnostic and therapeutic role of the anaesthesiologist in the management of an active bleeding patient, leading to a swift resolution of an otherwise possibly fatal condition.

- Active participation of the anaesthesiology team is essential to the differential diagnosis in cases of oropharyngeal haemorrhage.

11AP01-2

Case report: anesthetic challenges and strategies in a patient with pulmonary hypertension

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Background: Pulmonary Hypertension (PHT)

Case Report: A 37 years old female presented with right iliac fossa pain, diagnosed with ectopic pregnancy. The scan showed ruptured sac in right fallopian tube. Because of intra-peritoneal collection evidence, surgical decision was for emergency oophorectomy.

Anaesthetic review revealed that she is known idiopathic pulmonary hypertension on taladenfil 40mg, selexigap 200mcg, Macitentan 10mg. Medical records traced diagnosis in 2022, showed evidence for dilated right atria and ventricle. Along with limited exercise tolerance with history of chest pain and fainting < 20 seconds.

At time of examination, patient was haemodynamically stable, as no tachycardia and blood pressure were maintained, however, surgical decision was for urgent intervention for likely possibility for further deterioration based on scan assessment.

At briefing, surgical team was advised to adopt open surgical approach rather than laparoscopic one to avoid complications expected. Spinal anaesthesia was chosen as best modality, along with continuous invasive blood pressure monitoring. Spinal drugs used bupivacaine 0.5% 3.5 ml and diamorphine 500mcg. Before starting spinal anaesthesia, infusion of vasopressor (metaraminol) commenced.

Intraoperatively, target was to keep mean arterial blood pressure (MAP) at 65mmHg. During operation, no adverse events were recoded. Minimal blood loss was estimated.

At recovery, patient continued metaraminol as to achieve target MAP. Later, transferred to HDU of closer monitoring. Later after 2 days, Discharged uneventfully.

Discussion: PHT is defined as mean pulmonary pressure equal or > 25 mmHg. Despite being on 3 agents, moderate pulmonary pressure on ECHO was detected. Initially, surgical technique was proposed as laparoscopic approach, however, after MDT meeting, accepted to be open one as increased intra-abdominal pressure reduce venous return and cardiac output.

In addition, with CO2 insufflation, this increases the end-tidal CO2, which affects negatively pulmonary vascular resistance (VR). In agreement, anaesthetic technique preferred was spinal block to avoid complication associated with general anaesthesia as most of anaesthetic drugs being negative inotropic.

Also, positive pressure ventilation can affect small pulmonary vessels can precipitate RV failure. In addition, spinal anaesthesia known to have a minimal or neutral effect on pulmonary VR.

The reason for metaraminol infusion was to counteract predictable decrease in systemic vascular resistance to maintain vital organs perfusion pressure including right ventricle.

References:

- 1. Perioperative management of patients with pulmonary hypertension undergoing non-cardiothoracic, non-obstetric surgery: a systematic review and expert consensus statement Price, Laura C. et al.
- 2. British Journal of Anaesthesia, Volume 126, Issue 4, 774 790

Learning Points: Central axial block (spinal anaesthesia) is considered as a safe alternative when applicable to avoid complications associated with general anaesthesia in cases of pulmonary hypertension.

11AP01-3

Anaphylactic shock induced by the combination of midazolam and patent blue dye

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Background: Perioperative anaphylaxis during anesthesia is a rare, but life-threatening condition. (1) The diagnosis can be challenging, as classic symptoms like rash are absent in severe cases. (1)

We report a case of anaphylactic shock following the administration of midazolam, a rare anaphylaxis trigger (2), and patent blue dye during breast cancer surgery.

Case Report: A previously healthy 30-year-old woman scheduled for a left mastectomy developed cardiovascular collapse unresponsive to vasopressors, shortly after general anesthesia induction and patent blue dye injection.

Although there were no respiratory or skin manifestations, the situation was interpreted as a possible anaphylactic shock. She was treated with epinephrine boluses and fluids, followed by a continuous epinephrine infusion due to partial response; rash and edema appeared 20 minutes later. She was stabilized and the surgery was postponed.

Elevated tryptase levels at 2 hours supported the diagnosis, with skin testing four weeks later confirming midazolam and patent blue dye as allergens. The surgery was safely performed five weeks later, omitting these agents.

Discussion: This case highlights the diagnostic challenges of perioperative anaphylaxis. The onset of cardiovascular collapse, unresponsive to vasopressors following the administration of patent blue dye and induction agents, strongly indicated anaphylaxis. Typical cutaneous symptoms emerged only 20 minutes after resuscitation, aligning with other reports of severe cases (2).

Tryptase levels supported the diagnosis, and skin tests identified midazolam and patent blue dye as causative agents. While patent blue dye is a relatively common trigger, midazolam is not; however, it can still provoke severe hypersensitivity in rare cases such as this. (2)

This case underscores the need to identify triggers for future management.

References:

1. Anaesthesia, surgery, and life-threatening allergic reactions: protocol and methods of the 6th National Audit Project (NAP6) of the Royal College of Anaesthetists Cook, T.M. et al. British Journal of Anaesthesia, Volume 121, Issue 1, 124 – 133 2. Shin JG, Hwang JH, Lee BS, Park HJ, Lee SH, Lee JN, Han DH, Kim JH. A case of midazolam anaphylaxis. Clin Endosc. 2014 May;47(3):262-5. doi: 10.5946/ce.2014.47.3.262. Epub 2014 May 31. PMID: 24944992; PMCID: PMC4058546

Learning Points: Maintain a high suspicion of anaphylaxis in cases of unexplained cardiovascular collapse under anesthesia.

11AP01-4

Neurologic alterations following cerebral angiography: serotonin syndrome or the butterfly effect

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Background: Serotonin syndrome (SS) is a relatively rare clinical condition that can arise in the perioperative period. The clinical picture can be life-threatening, and comprises a triad of changes in mental status, neuromuscular abnormalities and autonomic hyperreactivity.¹

Interventional Neuroradiology procedures have the potential for neurologic complications in the postoperative period.²

This can make more difficult the adequate diagnosis of SS.

Case Report: A 30-year-old woman with no known previous illnesses or usual medication was admitted for an elective endovascular embolization of a cerebral arteriovenous malformation (AVM). She was submitted to general anesthesia with a propofol infusion and an initial bolus of fentanyl and rocuronium.

The procedure lasted for 2.5 hours, but was unsuccessful in treating the AVM. Ondansetron was administered at the end of the procedure, and the patient emerged uneventfully. In the following 24h, she presented with worsening of her mental status, muscle spacity, clonus in her left hand and hyperreflexia. She became progressively hypertensive, and mild hyperthermia was identified (38.2°C).

A hypothesis of SS secondary to propofol, fentanyl and ondansetron was advanced, and the patient managed accordingly. Complete resolution of symptoms was achieved under the course of the next three days.

The patient ended up needing a second cerebral angiography for better treatment planning. Conscious sedation with dexmedeto-midine infusion was implemented, and no adverse events were observed.

Later, she was successfully treated with radiosurgery.

Discussion: SS is a challenging diagnosis to make in the perioperative period, and is usually caused by multiple drug interactions. Concurrent use of antidepressants is a strong association, which this patient lacked!

In fact, other causes were proposed during her stay, including possible grand mal and contrast-induced encephalopathy. Nevertheless, the initial hypothesis was taken in account in the anesthetic approach for the second procedure.

Considering the patient's age, it is reasonable to assume that she will likely develop other health problems during her life, making unpredictable how this diagnosis might affect future care.

References:

1. BJA Education. 2020; 20(1): 10e17 2. BJA Education. 2016; 16 (5): 147–152

Learning Points: SS is a challenging diagnosis in the perioperative period. This case raises awareness to the impact of clinical decisions in patients' future care.

11AP01-5 Improving trauma theatre efficiency: a quality improvement project implementing a "golden trauma patient" initiative in Scarborough Hospital, UK

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Background and Goal of Study: Significant inefficiencies, characterized by substantial delays in theatre start times, plague emergency orthopaedic services at Scarborough Hospital. These delays contribute to elevated operational costs and potentially compromise patient care. This quality improvement (QI) project aimed to mitigate these inefficiencies and enhance theatre efficiency by implementing a structured "Golden Trauma Patient" (GTP) initiative.

Materials and Methods: Baseline data (January-May 2024) established existing inefficiencies. A "Golden Trauma Patient" (GTP) initiative, involving pre-operative preparation and anaesthetist assessment, was implemented using a standardized operating procedure (SOP). Two PDSA cycles evaluated the intervention's impact on theatre start and turnaround times.



Figure. Golden Trauma Patient: Orthopedics lists Start date: 28 May 2024

Results and Discussion: PDSA cycle 1 yielded a significant reduction in theatre start times, although turnaround times increased. While PDSA cycle 2 maintained the improved start times (p=0.07), consistent improvement in turnaround times was not observed. These findings highlight the need to address challenges of communication and staff engagement to achieve sustained improvements in start and turnaround times.

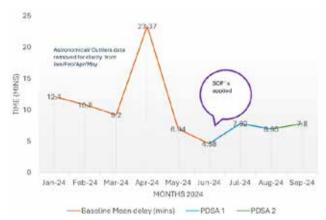


Figure. Monthly delay start times (minutes).



Figure. Turnaround times (mins).

Conclusion(s): The GTP initiative reduced emergency orthopaedic theatre start times. However, sustained improvement necessitates addressing protocol adherence, communication, and staff engagement to optimize start and turnaround times. Further refinement and robust implementation strategies are crucial for long-term efficiency gains.

11AP01-7

Use of transesophageal echocardiography in radical nephrectomy with inferior vena cava tumor thrombectomy: a case series

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Background and Goal: Renal cell carcinoma is a type of kidney cancer that can spread locally, forming a tumor thrombus within the renal vein. This thrombus may extend into the inferior vena cava (IVC) or even reach the right atrium, complicating surgical management and increasing the risks of thrombus migration and cardiovascular complications.

The use of transoesophageal echocardiography (TOE) is increasing in radical nephrectomy with IVC tumour thrombectomy. TOE provides detailed characterization of thrombus extension, facilitating optimal selection of the venous clamp site and enabling real-time detection and prevention of potential complications. The recommendations for TOE use according to different guidelines are ambiguous and evidence is limited.

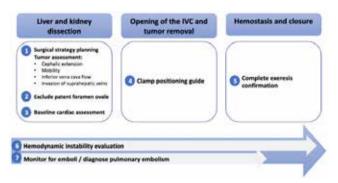
The goal of the study is to describe our experience with the TOE implementation during this type of surgery.

Methods: We conducted a retrospective review of 5 patients scheduled for open resection of renal cell carcinoma with level III-IV IVC invasion between January 2019 and December 2024. An specific TOE protocol for this surgery (figure 1) had been previously implemented. TOE was performed by an expert anaesthesiologist in echocardiography.

Results: In Table 1 we present a total of 7 findings in the 5 registered patients. All findings led to specific early interventions that significantly modified clinical management.

Patient	Findings	Further actions and management / impact
1	Supplemental morphologic information (Right Atrium tumour extension)	Reassessment of the need for cardiopulmonary bypass
	Hypovolemia	Fluid therapy administration
2	Incomplete resection	Reclamping and new resection
	Refractory hypotension secondary to systolic anterior motion	Fluid therapy administration, control of heart rate and optimisation of mean blood pressure
3	Pericardial effusion	Surgical drainage
4	Right atrial emboli	Echographic monitoring for right ventricular dysfunction
5	Refractory hypotension secondary to systolic anterior motion	Fluid therapy administration, control of heart rate and optimisation of mean blood pressure

Table 1. TOE findings and further management.



Conclusions:

- In this case series, the use of TOE has provided useful information in all patients. Specific interventions were conducted and successfully resolved clinical problems.
- Developing specific TOE protocols could address knowledge gaps in non-cardiac anesthesia teams, optimizing patient management and enhancing clinical outcomes.

11AP01-8

Enhancing total intravenous anesthesia monitoring with bispectral index (BIS) and patient state index (PSI): a prospective randomized comparison of remimazolam and propofol on depth, recovery, and haemodynamics

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Background and Goal of Study: Remimazolam, an ultrashort-acting benzodiazepine, has recently been approved for general anesthesia in Europe, expanding its clinical applications. Despite its growing utilization, the comparative effects of remimazolam and propofol on anesthesia depth, as measured by bispectral index (BIS) and patient state index (PSI), remain underexplored. This study aims to compare the effects of total intravenous anesthesia with remimazolam and propofol on BIS-PSI correlation, as measures of anesthesia depth, along with recovery profiles, haemodynamics and side effects.

Materials and Methods: This prospective, randomized, singleblinded study included ASA II and III patients undergoing laparoscopic cholecystectomy. Participants were randomized into a remimazolam group, receiving remimazolam (0.25 mg/kg induction dose), and a propofol group, receiving propofol (2 mg/kg induction dose). Both groups received remifentanil, with continuous drug doses titrated to maintain target BIS values 40–60 and PSI values 25–50, defining general anesthesia. BIS and PSI monitors were placed simultaneously on each patient.

The primary outcome was the correlation between BIS and PSI during anesthesia.

Secondary outcomes included times to achieve adequate anesthesia depth (BIS<60, PSI <50), recovery times (BIS > 80, PSI > 50 and > 75, extubation), haemodynamic parameters (systolic and diastolic BP).

Results and Discussion: Data from 20 patients revealed a strong, statistically significant correlation between BIS and PSI values in both groups. Repeated measures correlation were r=0.938 (p < 0.001, 95% CI: [0.910, 0.960] for remimazolam (n=9) and r=0.937 (p < 0.001, 95% CI: [0.910, 0.960]) for propofol (n=11). Propofol demonstrated faster induction than remimazolam with shorter times to achieve BIS < 60 (30.0 \pm 16.5 seconds vs. 49.0 \pm 44.0 s, respectively, p = 0.017) and PSI < 50 (73.0 \pm 18.0 s vs. 155.9 \pm 73.6 s, respectively, p = 0.010).

Recovery was also faster in the propofol group, with shorter times to BIS > 80 (411.7 \pm 178.1 s vs. 611.1 \pm 201.7 s, p = 0.031) and extubation (448.2 \pm 191.2 s vs. 675.9 \pm 182.6 s, p = 0.015). Linear-mixed effects model observed no statistically significant differences between groups for hemodynamic parameters.

Hypotension occurred more frequently in the propofol group (36.4%) than in remimazolam group (22.2%), but the difference was not statistically significant. No significant differences were observed in PSI > 50 and > 75 recovery times or total anesthesia duration.

Conclusion(s): Both remimazolam and propofol demonstrated strong positive BIS and PSI correlations, reinforcing the reliability of these agents for monitoring anesthesia depth. Propofol facilitated faster induction and recovery, while remimazolam's characteristics may offer advantages for prolonged procedures. These findings highlight the utility of BIS and PSI in monitoring anesthesia depth with both agents.

11AP01-9

The objective evaluation on facial flushing through a laparotomy by a pocket-sized color sensor; a multicenter observational study

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Background and Goal of Study: Mesenteric traction syndrome (MTS) is associated with facial flushing, hypotension and tachycardia. Facial flushing is a subjective assessment whose diagnostic criteria is ambiguous. We hypothesized that quantifying the color tone would allow us to evaluate facial flushing objectively in undiagnosed MTS patients.

Materials and Methods: This study was a multicenter observational study. Patients scheduled for pancreaticoduodenectomy or distal pancreatectomy for laparotomy surgery were enrolled. Patients taking NSAIDs or antihistamines were excluded. Using a Nix color sensor (Nix Sensor Ltd., Ontario, Canada), we measured the value of redness (Lab color system a- value) at four points of face periodically before and 90 minutes after skin incision.

Simultaneously, pulse rate and arterial blood pressure were recorded. An anesthesiologist at each case diagnosed with MTS and assessed the degree of facial flushing on a three-point scale (Level 0; no flushing, Level 1; slight flushing, Level 2; complete flushing).

We classified patients into two groups. Patients diagnosed with MTS were assigned to MTS group and the others were assigned to non-MTS group. In non-MTS group, we evaluated the ratio of change in a-value in patients with tachycardia and decreased blood pressure with a subjective rating of less than Level 2. The ratio of change was defined as the ratio of the difference between the maximum value (a-value and heart rate) or minimum value (blood pressure) and base value. This base value meant the average value 5 minutes before and after skin incision. EZR software was used for the statistical analyses.

Results and Discussion: Thirty-eight patients were included, 14 in the MTS group and 24 in the non-MTS group. The median ratio of change in a-value [interquartile range] for the four facial points was 0.45 [0.43-0.49] vs. 0.25 [0.12-0.55] (p=0.02) in the MTS and non-MTS groups. The ratio of change in heart rate was 0.45 [0.38-0.52] vs. 0.23 [0.17-0.27] (p<0.01) and the ratio of change in mean arterial blood pressure was -0.26 [-0.41-(-0.20)] vs. -0.14 [-0.24-(-0.09)] (p=0.01). In the non-MTS group, only 1 out of 24 cases met the threshold value of the ratio of change in heart rate and mean arterial blood pressure calculated from the MTS group and the subjective evaluation was less than Level 2.

Conclusion: The demand of objective evaluation for MTS diagnosis was rare, therefore conventional subjective evaluation can be enough.

11AP01-10 Pediatric patients with Autism Spectrum Disorder (ASD): what anesthetic management?

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Background and Goal of Study: Pediatric patients with Autism Spectrum Disorder (ASD) present unique challenges in anesthesia management due to sensory sensitivities, communication difficulties, and behavioral issues. Both general anesthesia (GA) and regional anesthesia (RA) are commonly used for pediatric surgeries, but their application in children with ASD may lead to distinct complications.

This study aims to evaluate the complications and challenges encountered in 18 pediatric patients with ASD who underwent various surgical procedures requiring either GA or RA.

Materials and Methods: A survey was conducted in 10 hospital anesthesia departments on 35 pediatric patients diagnosed with ASD who underwent surgery between 2020 and 2023. The patients received either GA or RA (spinal, epidural, or peripheral nerve blocks) depending on the surgical procedure. Data on patient demographics, anesthetic techniques, intraoperative management, complications, and postoperative recovery were collected. Special attention was paid to challenges related to anesthesia induction, intraoperative issues, and recovery, particularly focusing on how ASD-related characteristics affected anesthetic management.

Results and Discussion: Of the 35 patients, 26 received GA, and 9 received RA. Common challenges included difficulty with preoperative communication and anxiety, with 60% of patients exhibiting resistance to induction or difficulty remaining still. For GA, complications included delayed emergence (30%) and increased agitation during recovery (40%). In patients receiving RA, difficulties included challenges in maintaining cooperation during block placement (42%) and postoperative pain management (35%). No severe adverse events were reported, but several patients required additional sedation for anxiety or sensory overload during the perioperative period.

Conclusion(s): Anesthesia in pediatric patients with ASD requires careful planning and individualized strategies. Both GA and RA can be safely used in this population, but complications such as anxiety, difficulty with sedation, and sensory sensitivities are common. Tailored anesthetic approaches, preoperative education, and close postoperative monitoring are essential to minimize risks and improve outcomes. Further studies are needed to optimize anesthesia protocols for children with ASD.

Reference:

Brogna C et al. Management of anesthesia in children with autism spectrum disorders. Minerva Anestesiol. 2024 Sep;90:719-721.

11AP01-11

The comparison of the incidence of postoperative delirium and emergence agitation between remimazolam and propofol in general anesthesia: a systematic review and meta-analysis

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Background and Goal of Study: Postoperative delirium (POD) is a common neurocognitive complication following surgery, and associated with an increased risk of postoperative complications and mortality. (1) Guidelines currently discourage the use of benzodiazepines perioperatively, which is linked to an elevated risk of developing POD. (2)

However, evidence regarding the risk of POD and emergence agitation associated with remimazolam, an ultra-short-acting benzo-diazepine used for procedural sedation and general anesthesia, remains limited.

Materials and Methods: We perform a comprehensive literature search across 2 electronic databases, PubMed and the Cochrane Central Register of Controlled Trials. The search strategy utilizes the keywords "remimazolam" AND "propofol" AND ("delirium" OR "emergence agitation"), supplemented by MeSH terms for enhanced precision.

We include all randomized controlled trials (RCTs) that compared the incidence of postoperative delirium and emergence agitation between remimazolam and propofol in patients undergoing general anesthesia. Data extraction, synthesis, and risk of bias assessment are conducted.

Results and Discussion: A total of 6 articles that meet the inclusion criteria. The pooled data indicate no significant difference in the incidence of postoperative delirium (OR, 1.06; 95% CI, 0.75 to

1.49; n = 1270; p = 0.63; I^2 = 0%, Figure 1A) or emergence agitation. (OR, 0.72; 95% CI, 0.40 to 1.30; n = 468; p = 0.28; I^2 = 79%, Figure 1B). The findings indicate that the use of remimazolam during surgery does not lead to a higher incidence of postoperative delirium or emergence delirium within the initial three days following the procedure compared to propofol.

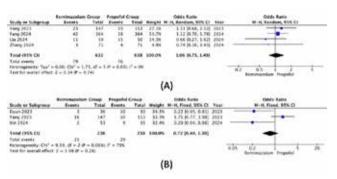


Figure 1. The forest plot of the incidence of postoperative delirium (A) and emergence agitation (B)

Conclusion(s): Compared to propofol, intraoperative administration of remimazolam demonstrates a comparable risk of postoperative delirium within the initial three days after surgery.

References:

- 1. Saczynski. N Engl J Med. 2012;367(1):30-39. doi:10.1056/ NEJMoa1112923
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11AP02-1

Unexpected hyperkalaemia in robot assisted radical prostactectomy

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Background: A 68 year old gentleman with a background of hypertension, hyperlipidemia, diabetes and chronic kidney disease underwent robot assisted radical prostatectomy (RARP) and developed unexpected hyperkalaemia intraoperatively.

Case Report: A 68 year old gentleman presented to the hospital for RARP, the surgery took a total of 5 hours and 22 minutes in the steep Trendelenburg position. 2.5 hours into the surgery, an ABG showed unexpected hyperkalaemia: pH 7.33 paCO2 42 K 6.2 glucose 12.9 base excess -4 bicarbonate 22. Insulin-dextrose therapy was initiated, further investigation revealed normal serum ketone (pre-existing diabetes) and stable renal function.

Post-extubation, he complained right arm muscle pain, which was an old injury. Creatine kinase was checked and found to be elevated at 166 U/L. The patient was kept on IV fluids postoperatively to maintain urine output, he was discharged uneventfully on postoperative day 2.

Discussion: RARP is a prolonged surgery performed in the steep Trendelenburg with lithotomy position. Hypoperfusion of the lower limbs can lead to complications such as muscle injury, rhabdomyolysis and lower limb compartment syndrome. Creatine kinase often rises in the postoperative period even in asymptomatic patients

When hyperkalaemia develops intraoperatively, potential causes include renal impairment, metabolic acidosis, medication such as suxamethonium or red blood cell transfusion, or cellular injury such as rhabdomyolysis. In our patient, hyperkalaemia was unexpected and on investigating, metabolic acidosis and renal impairment were ruled out. After extubation, the patient mentioned muscle pain in his arm (likely incidental given that it was an old injury) and the creatine kinase was found to be high. Thus, hyperkalaemia in our patient was likely due to intraoperative position-related muscle injury. In surgeries requiring Trendelenburg position, if unexpected hyperkalaemia develops, the creatine kinase should be checked to investigate for muscle injury and rhabdomyolysis.

Reference:

J Endourol. 2013 Jan;27(1):45-51. doi: 10.1089/end.2012.0169. Epub 2012 Sep 10. PMID: 22770120.

Learning Points: Patients undergoing robot assisted radical prostatectomy or any surgeries in steep trendelenburg can develop unexpected intraoperative hyperkalaemia, causes include renal impairment and metabolic acidosis, however it is also important to check creatine kinase to look for muscle injury and rhabdomyolysis.

11AP02-2

Evolution of gender equity among authors in anaesthesiology and paediatric anaesthesiology research articles: a comparative scientometric analysis

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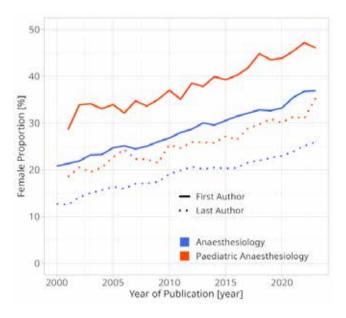
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Background: Females are still underrepresented in academic medicine. This gender disparity in leading authorship positions may also be observed in the field of paediatric anaesthesiology. We hypothesised notable differences in female authorship patterns in paediatric anaesthesiology when compared to overall anaesthesiology. To test this, we conducted a scientometric analysis.

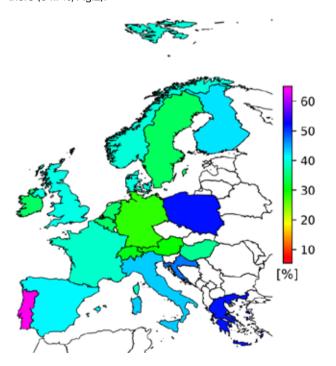
Methods: The MEDLINE/PubMed 2024 Baseline database was converted to PostgreSQL, and anaesthesiology-related articles were extracted using a comprehensive regular expression applied to affiliation strings. Paediatric anaesthesiology articles were filtered using an existing database [Miller et al. 2024]. Author gender was inferred via GenderAPI and Genderize online services, applied to forenames. Countries were identified through text-mining of affiliation strings.

Results and Discussion: We identified 374,978 anaesthesiology articles (2,249,636 authorships) and 34,426 paediatric anaesthesiology articles (218,219 authorships) from 1987 to 2023. The pro-

portion of female authors in anaesthesiology was 38.2% among first authors and 25.7% among last authors, compared to 30.7% and 20.7%, respectively, in paediatric anaesthesiology.



Although trends in gender distribution were similar, female authorship was higher in paediatric anaesthesiology compared to overall anaesthesiology articles, with a difference of approximately 8% among first authors and 5% among last authors (Fig.1). Among countries, Portugal had the highest share of female authors (64.7%, Fig.2).



Conclusions: Despite the persistence of a gender gap in paediatric anaesthesiology and anaesthesiology overall, recent trends indicate a reduction in this disparity. Paediatric anaesthesiology exhibits a higher proportion of female lead authors than overall anaesthesiology. However, targeted efforts are necessary to advance gender equity.

11AP02-3

Effectiveness of short prehabilitation program in a mix group of frail patients

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Background and Goal of Study: Prehabilitation aims to enhance functional capacity to better manage surgical stress perioperatively. Singapore General Hospital's "Prehabilitation for Elderly Frail Patients Undergoing Elective Surgeries" (PREPARE) targets frail patients undergoing major surgery to optimize physical fitness through physiotherapy education and individualized exercise programs.

Evidence suggests prehabilitation should be supervised, targeting moderate to vigorous intensity over at least three weeks. However, frail patients are typically scheduled for surgery within 2-4 weeks, presenting a significant challenge.

This study evaluates the PREPARE program's impact on physical fitness pre- and post-prehabilitation with a shortened intervention

Materials and Methods: Patients aged >50 years undergoing major surgery were screened for frailty using the Edmonton Frail Scale. Frail patients received routine preoperative physiotherapy, education, home exercises, and inspiratory muscle training (if Maximal Inspiratory Pressure [MIP] < 100 cmH2O). Patients with >2 weeks before surgery were offered supervised sessions, including aerobic and resistance exercises targeting a Borg rate of perceived exertion of 3-5/10.

Baseline and post-program measures included MIP (digital manometer), handgrip strength (HGS, Jamar® dynamometer), 30-second and 1-minute Sit-to-Stand (STS), usual gait speed (GS), and 6-minute walk test (6MWT). Data were analyzed using paired t-tests with SPSS v22.

Results and Discussion: Between 2023 and 2024, 19 patients completed 2-4 supervised sessions, limited by surgical lead time. Improvements were observed in HGS (18.39kg \pm 6.27 to 19.20kg \pm 7.37), GS (0.70m/sec \pm 0.43 to 0.78m/sec \pm 0.37), 6MWT (172.19m \pm 110.43 to 173.38m \pm 109.83), and MIP (91.33cmH2O \pm 40.07 to 103.00cmH2O \pm 57.82). However, none were statistically significant.

Conclusion(s): Prehabilitation trends indicate improved physical fitness with supervised sessions, even with a shortened duration. Minimal improvements suggest potential for meaningful change, warranting further studies with larger samples and program adjustments to fully evaluate efficacy.

Acknowledgements (optional): Staff at preadmission clinic for the primary frailty screening and the physiotherapy team for their effort in prehabilitating the patients

Improved Perioperativ Risk assessment and EDucation with Interactive Consultation Tool (iPREDICT) – Assessment of patients' knowledge about anaesthesia related risks after preoperative face-to-face consultation visit

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Background and Goal of Study: Preoperative anaesthetic assessment is often time-limited in routine clinical practice. An essential part of this process is patient empowerment, which includes patient education and involvement in decisions related to their anaesthetic care pathway.

The overall goal of this prospective, randomized, placebo-controlled clinical study is to investigate the feasibility of using an Interactive Consultation Tool (ICT) during the pre-operative period, thereby improving patient's knowledge and awareness of the risks associated with anaesthesia.

Materials and Methods: Patients scheduled for elective surgery under general or combined anaesthesia (n=246) were randomly assigned to either the ICT group or the control group. The ICT group was informed about anaesthesia procedures and risks by video and text, while the control group received patient safety but not anaesthesia-related video content.

All participants took part in the routine preoperative face-to-face consultations and were surveyed about 15 items immediately after the consultation and again 2 days later (risk recall) via an online questionnaire to assess retained information.

Results and Discussion: Demographic analysis of the initial study results showed an average participant age of 54.1 years, with 66 % male and 34 % female participants. At baseline, participants expressed a moderate level of need for knowledge about the anaesthesia.

After the premedication visit, the ICT group showed a higher, but not significant tendency to remember more anaesthesia risks. At the risk recall visit two days later after premedication visit, a significant higher number of risks could be correctly remembered by patients of the ICT group (p < 0.05).

These results indicate a greater improvement in the anaesthesia risk recall in the experimental group compared to the control group.

Conclusion(s): The findings of this study suggest that the use of an ICT during the preoperative period can significantly enhance patients' retention of anaesthesia-related risk information.

By supplementing routine face-to-face consultations with interactive video and text content, the ICT promotes better patient understanding and recall of critical information, potentially contributing to improved patient empowerment and shared decision-making. Further research is warranted to explore the long-term impact of such tools on patient outcomes and satisfaction.

11AP02-5

Comparative analysis of lactate clearance as a predictor of adverse postoperative events in patients with cardiovascular-kidney-metabolic syndrome in non-cardiac surgery

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Background: Recently introduced cardiovascular-kidney-metabolic syndrome (CVKMS) is defined as a health disorder associated with obesity, diabetes mellitus, chronic kidney disease, and cardiovascular disease. Patients with CVKMS are at risk for adverse perioperative events.

Postoperative hyperlactatemia is independently associated with an increased risk of complications after major non-cardiac surgery.

Goal of Study: To conduct a comparative analysis of the dynamic parameters of blood lactate levels with postoperative complications and the length of stay in patients with CVKMS and metabolic syndrome (MetS) after non-cardiac surgical interventions.

Materials and Methods: 51 patients were divided into the CVKMS group (n = 17) and MetS group (n = 34). Both the peak concentration and clearance of blood serum lactate in the first 0, 6, 12, 18, 24 and 48 hours after surgery were calculated. Lactate concentration greater than 2.0 mmol/L was defined as hyperlactatemia. Endpoints were the severity of complications according to the Clavien-Dindo classification and the length of stay.

Results and Discussion: Peak lactate concentrations were statistically significantly higher and lactate clearance was significantly lower in the CVKMS group in comparison with MetS group. 53% of patients developed hyperlactatemia.

Lactate clearance after surgery was significantly lower in patients with hyperlactatemia. In patients with CVKMS, the degree of severity of postoperative complications and the length of stay were significantly bigger.

Conclusions: Peak lactate concentration and lactate clearance 12 hours postoperatively are significantly higher in patients with CVKMS. Postoperative hyperlactatemia over 2.0 mmol/l is associated with the occurrence of complications and prolongation of treatment.

Keywords: cardiovascular-kidney-metabolic syndrome, lactate, postoperative complications, outcomes

Effectiveness of multimodal analgesia in Robot-assisted laparoscopic Radical Prostatectomy (RALRP): comparison with conventional analgesia

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Background and Goal of Study: Multimodal analgesia (MA) combines various analgesic medications to enhance pain management. Its benefits include better pain control, reduced opioid use, fewer side effects, and quicker recovery. MA is particularly effective in improving patient comfort and overall recovery, making it a recommended approach in Enhanced Recovery After Surgery (ERAS) protocols.

This study aims to evaluate the effectiveness of MA compared to conventional analgesia (CA) in managing pain and improving patient outcomes in RALRP.

Materials and Methods: A retrospective observational cohort study was conducted with patients undergoing RALRP, comparing those receiving CA (fentanyl or sufentanyl) to those treated with MA (lidocaine, dexmedetomidine, and magnesium sulfate). Both groups received postoperative analgesia with dexketoprofen, paracetamol, and morphine as needed.

Primary outcomes included intraoperative opioid use (measured in morphine sulfate equivalents) and postoperative pain levels assessed via the Visual Analog Scale (VAS). Side effects, such as the need for vasopressors, antihypertensives, and the incidence of nausea and vomiting, were also recorded.

Statistical analysis was performed with T-student test for quantitative variables and Fisher or Chi-squared tests for qualitative dichotomic variables. Significance was set at p-value < 0.05.

Results and Discussion: This study included 133 patients (55 in CA and 78 in MA). No significant demographic differences were observed. Intraoperative opioid use was significantly lower in the MA group (19.88 \pm 7.33) compared to the CA group (30.97 \pm 8.72, p < 0.01).

Postoperative pain levels showed no significant differences in the first 6 hours (CA: 1.57 ± 2.09 vs. MA: 1.77 ± 2.10 , p = 0.58), but a trend towards higher pain scores in the MA group at 24 hours (CA: 0.33 ± 1.34 vs. MA: 0.78 ± 1.34 , p = 0.06) was observed.

The need for additional morphine and the incidence of nausea and vomiting were similar between groups. Intraoperative requirements for vasopressors and antihypertensives showed no significant differences.

Conclusion(s): Our findings suggest that while MA significantly reduces intraoperative opioid use, it does not appear to improve postoperative pain control as indicated by VAS scores and morphine rescue. CA group need higher requirements for antihypertensives. Our results should be confirmed in larger prospective studies.

11AP02-7

Anaesthesia for awake spine surgery in high-risk patients using opioid-free conscious sedation without spinal or regional anaesthesia

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Background: Spine surgeries, typically performed under general anesthesia, pose risks for patients with severe comorbidities like COPD or ischemic heart disease (IHD), often excluding them from surgery and leaving them in pain. Awake spine surgeries reduce perioperative risks, opioid use, and costs, specifically in lumbar procedures!

Spinal and regional techniques like erector spinae or thoracolumbar interfascial plane blocks employed by some centres can target dorsal rami but may risk respiratory compromise.

This case highlights opioid-free awake spine surgery in a patient with GOLD E COPD.

Case Report: A 71-year-old male (BMI 22) with COPD (FEV1 39% predicted), IHD, rheumatic heart disease (metallic valves), Stage 2 CKD, and cervical spondylosis underwent L4/5 lateral recess stenosis endoscopic decompression under opioid-free sedation without regional or spinal techniques.

He self-positioned prone with protected pressure points. Standard monitors were applied. IV glycopyrrolate (0.2 mg) controlled secretions.

Oxygen at 2L/min was delivered via nasal prongs. Sedation was initiated with a propofol-ketamine infusion (1% propofol 50ml:50 mg ketamine) at 2 mcg/ml (TCI Marsh model). Once ketamine dose 0.5 mg/kg was achieved, sedation continued with propofol alone.

The surgical site was infiltrated with 10 ml of 0.5% bupivacaine. The patient remained awake, comfortable, and hemodynamically stable.

Recovery was uneventful; he reported mild calf cramping (pain score: 2), mobilized the next day, and was discharged well.

Discussion: Opioid-free conscious sedation provides a safer option for high-risk patients, minimizing respiratory, cardiovascular, and opioid-related risks².

Conscious sedation enables real-time neuromonitoring, symptom recreation, and self-positioning, reducing prone-positioning risks and avoiding airway instrumentation. This technique facilitates hemodynamic stability, early mobilization, and potential sameday discharge, making surgery feasible for medically complex patients.

Learning Points:

- 1. Opioid-free sedation minimizes perioperative risks for high-risk patients.
- 2. Awake patients provide real-time feedback, ensuring surgical precision.
- Self-positioning and avoidance of general anaesthesia enhances safety.

References:

- 1. Wilson JP, Bonin B, Quinones C, et al. Spinal anesthesia for awake spine surgery. *J Clin Med.* 2024;13(17):5326.
- 2. Sharma S, et al. Awake spine surgery: clinical advantages and outcomes. *J Clin Anesth.* 2020;65:109875.

Anaesthesia in a patient with anti-N-methyl-D-aspartate receptor encephalitis

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Background: Anti-N-methyl-D-aspartate (NMDA) receptor encephalitis is immune-mediated, caused by production of IgG antibodies against the NMDA receptor in the nervous system. Anti-NMDA encephalitis is often associated with ovarian teratomas and resection of the tumour can facilitate earlier functional recovery. Many anaesthetic agents have interactions with NMDA receptors.

There is no definite recommendation of anaesthesia technique for patients with anti-NMDA receptor encephalitis currently.

Case Report: A previously well 14 year old female was diagnosed with anti-NMDA encephalitis after being admitted for seizures and psychosis. She was treated with IVIG and methylprednisolone and although the seizures resolved, her psychosis did not. Further scans revealed an ovarian lesion which is often associated with anti-NMDA encephalitis.

She was then listed for emergency laparoscopic cystectomy for removal of the likely ovarian teratoma. We conducted general anaesthesia using a target controlled infusion of propofol with Sed-line monitoring.

Multimodal analgesia with a regional technique, paracetamol, and ibuprofen was used in combination with fentanyl boluses. The following day her psychosis had resolved and the patient was back to her normal cheerful demeanour.

Discussion and Learning Points: Commonly used anaesthetic agents that inhibit NMDA receptors include ketamine, nitrous oxide, and volatile anaesthetics. Anaesthetic agents with effects on NMDA receptors become unpredictable in patients with anti-NMDA receptor encephalitis.

Therefore we avoided the use of anaesthetic agents with effects on the NMDA receptor by employing total intravenous anaesthesia. Pain management may also be challenging due to alterations in pain perception or the ability of patients to communicate their pain. Hence multimodal analgesia was utilised.

Anti-NMDA encephalitis may have cardiovascular and respiratory involvement, as well as autonomic dysfunction and temperature dysregulation. Hence the patient should be thoroughly assessed for these complications and managed accordingly.

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Shaikh MA, Dhansura T, Gandhi S, Shaikh T. Anaesthetic management of a patient with anti-NMDA receptor encephalitis. *Indian J Anaesth*. 2015;59(4):248-250.

11AP02-9

Systematic review and meta-analysis of high fraction of inspired oxygen for surgical site infection prevention

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Background and Goal of Study: Increasing the fraction of inspired oxygen (FiO₂) may reduce the rate of surgical site infection (SSI) by optimising tissue oxygenation.¹

Several new studies have been published on the use of high (0.8) ${\rm FiO_2}$ and the possible association with lower rates of SSI after the WHO guideline update found less effect and weaken their recommendation of high ${\rm FiO_2}$.²

This systematic review and meta-analysis of randomised controlled trials updates the current literature on the effect of high ${\rm FiO_2}$ compared with standard ${\rm FiO_2}$ on SSI incidence in patients undergoing surgical procedures.

Materials and Methods: The databases Medline (OVID) and Embase (Embase.com) were searched with relevant search terms up to 18th of August 2023. Randomised controlled trials were selected based on high ${\rm FiO_2}$ compared with standard ${\rm FiO_2}$ to prevent postoperative wound infections.

Subgroup analysis was performed on the incidence of SSI in patients in which high ${\rm FiO_2}$ or standard ${\rm FiO_2}$ was administered via endotracheal intubation versus a face mask without endotracheal intubation

Results and Discussion: Twenty-seven studies were included after title and abstract screening and reading the full text. The results were pooled in a meta-analysis.

The pooled number of SSI in the high ${\rm FiO_2}$ treatment group was 885/8402 (10.5%), compared to 1039/8364 (12.4%) in the standard FiO2 treatment group, and resulted in a pooled relative risk ratio of 0.84 (95% CI 0.73 to 0.96), in favour of high ${\rm FiO_2}$ treatment. SSI in patients who received high or standard ${\rm FiO_2}$ administered via endotracheal intubation were reported in 22 trials.

The pooled number of SSI in the high FiO2 treatment group, administered via endotracheal intubation, was 789/7491 (10.5%), compared to 956/7434 (12.9%) in the standard ${\rm FiO_2}$ treatment group, administered via endotracheal intubation, and resulted in a pooled relative risk ratio of 0.79 (95% CI 0.68 to 0.91), in favour of high ${\rm FiO_2}$ treatment.

Conclusion(s): High ${\rm FiO_2}$ results in less SSI than standard ${\rm FiO_2}$ in patients undergoing surgical procedures. Our results justify a stronger recommendation for the use of high ${\rm FiO_2}$ via endotracheal intubation.

Reference:

1. Hopf HW et al. *Arch Surg.* 1997;132:997-1004; 2. de Jonge S et al. *Br J Anaesth.* 2019;122:325–34.

Total intravenous general anaesthesia in a Glucose-6-Phosphate Dehydrogenase deficiency child

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Background: Glucose-6-phosphate dehydrogenase (G6PD) deficiency is the most common enzymatic disorder of red blood cells (RBCs), inducing an inability to protect them against oxidative stresses, triggering haemolytic crisis. In these patients is crucial to avoid drugs that can precipitate haemolysis.¹

This case report describes the management of total intravenous general anaesthesia in a paediatric patient with G6PD deficiency.

Case report: A 6-year-old male with G6PD deficiency, ASA II, presented for endoscopic treatment of vesicoureteral reflux. He had no history of acute hemolytic episodes, comorbidities, previous hospitalizations, or allergies and was not on any medication. Preoperative evaluation revealed normal laboratory analysis and no evidence of infection or hemolysis.

A total intravenous general anesthesia (TIVA) was induced with fentanyl, propofol and rocuronium and maintained with propofol under pressure-controlled ventilation. We did not administer any local anesthetics. The procedure was uneventful.

After adequate recovery, the patient was discharged on the same day. At the one-week postoperative follow-up, no adverse events were reported.

Discussion: In G6PD deficiency, RBCs are unable to defend against oxidative stress, leading to loss of function and haemolysis. While most individuals are asymptomatic, factors like infection, metabolic conditions, certain drugs and specific foods can trigger haemolysis. The anaesthetic risk depends on the severity and onset of anaemia.

The main perioperative goal is to minimize the risk of haemolysis, by avoiding oxidative drugs such as non-steroidal anti-inflammatory drugs and sulphonamides. Local anaesthetics that may cause methemoglobinemia should also be avoided, since methylene blue may trigger haemolysis.¹

In this case, the patient had normal blood tests and no clinical signs of infection, limiting pre-operative oxidative stressors before elective surgery. TIVA has no documented association with haemolytic crisis, revealing a safe and effective choice.

References:

Cicvarić A, et al. Management of Anesthesia and Perioperative Procedures in a Child with Glucose-6-Phosphate Dehydrogenase Deficiency. *Journal of Clinical Medicine*. 2022; 11(21):6476.

Learning points:

- The anaesthetic aim is to reduce oxidative stress and monitor signs of haemolysis.
- 2. TIVA proved safe and effective in the management of a child with G6PD deficiency.

11AP02-11

Postoperative anisocoria after general anesthesia: A cause for concern – a case report

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Background: Postoperative anisocoria (PA) after general anesthesia (GA) can signal life-threatening conditions, such as intracranial pathologies or ocular injury.^{1,2} Prompt evaluation is crucial to rule out serious causes.

We present a case of unilateral mydriasis after a routine septoplasty and inferior turbinate reduction, highlighting the need for timely assessment.

Case Report: An 18-year-old healthy male, ASA 1, underwent GA for nasal septoplasty and bilateral turbinectomy. Preoperatively, he had stable vital signs, a Glasgow Coma Scale of 15, normal pupil size and reactions, and no neurological deficits.

After anesthesia induction, his eyes were taped closed, and surgical compresses soaked in phenylephrine and cocaine paste were used for nasal mucosal vasoconstriction.

The surgery was lengthy but uneventful. Upon awakening, anisocoria was detected, with the left pupil more dilated than the right (~4-5mm).

There were no associated symptoms, pupillary light reflexes were normal and neurological examination revealed no other abnormalities. The anisocoria resolved within four to six hours, and the patient was discharged on the second postoperative day without complications.

Discussion: PA following nasal surgery under GA can be concerning due to potential serious causes, including oculomotor nerve injury or central nervous system damage.

In this case, after a thorough evaluation and the spontaneous resolution of anisocoria, it is likely caused by sympathomimetic agents like phenylephrine and cocaine, which may have entered the eye through the nasolacrimal duct, as reported in other cases. Cocaine may also enhance mydriasis by anesthetized the short ciliary nerve.

References:

1. Kaushal, A., Andleeb, R., Gupta, P., Talawar, P. (2023). Postoperative Anisocoria-need not be Concerned Always. *Turkish Journal of Anaesthesiology and Reanimation*, *51*(3), 278–279. https://doi.org/10.4274/TJAR.2022.221013

2. Azhdam, A., Liu, G., Lee, M. K. (2021). Unilateral mydriasis following septoplasty with inferior turbinate reduction. American Journal of Otolaryngology - Head and Neck Medicine and Surgery, 42(2), 102881. https://doi.org/10.1016/j. amjoto.2020.102881

Learning points: PA, while typically benign, can sometimes indicate serious complications. During sinus surgery, a dilated pupil may suggest intraorbital injury, but it is crucial to recognize that common nasal decongestants can also cause mydriasis, helping to reduce concern for the medical team.

Unexpected hypertensive episode following a dural tear in endoscopic spine surgery: a case report

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Background: Endoscopic spine surgery (ESS) is a minimally invasive treatment for spinal conditions, with dural tears (DT) occurring in 1.07-3.95% of cases^{1,2}.

Irrigation fluid entering via the DT has been linked to rare but significant neurological and cardiovascular manifestations^{2,3}.

Case report: V.M.M., a 58-year-old female (ASA II), underwent ESS under total intravenous general anesthesia with Propofol and Remifentanil. Mid-surgery, an hypertensive crisis (BP > 190/120 mmHg) without tachycardia, coincided with a DT requiring repair. Hypertension persisted despite increased Remifentanil doses. It partially resolved with Dexmedetomidine, allowing extubation. Post-extubation, the patient presented with severe agitation, hypertension, and tachypnea. Arterial blood gas revealed hypocapnia and lactate of 2.7 mg/dL.

Stabilization was achieved with Furosemide and Labetalol. The patient was monitored in the postanaesthesia recovery unit, and discharged the next day hemodynamically stable, without neurological deficits.

Discussion: This case highlights a differential diagnosis of an hypertensive crisis, particular to ESS. Management requires recognition of a DT and communication between surgeons and anesthesiologists. When suspected, treatment includes minimizing irrigation fluid pressure and timely surgery completion³.

Antinociceptive drugs, antihypertensives (diuretics, corticosteroids, dexmedetomidine), and fluid management are appointed in the literature as strategies to control the physiological impact of intraspinal pressure changes³.

References:

- 1. Yu H, Zhao Q, Lv J, et al. Unintended dural tears during unilateral biportal endoscopic lumbar surgery: incidence and risk factors. *Acta Neurochir (Wien)*. 2024;166(1):95. https://doi.org/10.1007/s00701-024-05965-8.
- 2. Vargas RAA, Hagel V, Xifeng Z, et al. Durotomy- and irrigation-related adverse events during spinal endoscopy: illustrative cases and surgeon survey. *Int J Spine Surg.* 2023. https://doi.org/10.14444/8454.
- 3. Zhang Y, Wu J, Qin Z, et al. Clinical features and management of seizure after percutaneous endoscopic spine surgery: retrospective analysis. *World Neurosurg.* 2022;167:e891–903. https://doi.org/10.1016/j.wneu.2022.08.104.

Learning points: This case contributes to the understanding of a rare complication in minimally invasive spinal surgery. It highlights a differential diagnosis of an ESS-related hypertensive crisis, and reviews treatment and strategies to improve intra and postoperative management.

11AP03-1

Management of a patient with Wolff-Parkinson-White (WPW) syndrome in open abdominal surgery: Case report

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Background: Wolff-Parkinson-White (WPW) Syndrome is a rare congenital cardiac conduction disorder, where electrical impulses are conducted via accessory pathways between the atrium and ventricle. This results in an increased risk of arrhythmias such as paroxysmal reentry tachycardias.

Case Report: A 56-year-old woman with asymptomatic WPW Syndrome and an ECG typical of pre-excitation underwent laparotomy for retroperitoneal liposarcoma. A propofol-based TIVA (total intravenous anaesthesia) was performed for its cardiostability.

For perioperative pain management, a T9-T10 thoracic epidural block was performed with ropivacaine 0.2% without adrenaline. Invasive monitoring was carried out with the FloTrac®/Vigileo® system to maintain goal-directed fluid therapy.

An intravenous fluid warmer was used to avoid hypothermia and a defibrillator was available. The surgery ended without arrhythmogenic events. Given her good evolution, the patient was discharged home a week later.

Discussion: Patients with WPW syndrome may require some form of surgery in their lifetime, so it is important to understand their pathophysiology: 80% of tachycardias are due to atrioventricular reentry arrhythmias and 20% are due to atrial fibrillation or flutter. During the preoperative period, a thorough cardiological history should be taken, as some patients are asymptomatic.

The anaesthetic management consists of an adequate maintenance of the balance between vagal and sympathetic tone, stable haemodynamics, avoiding stimuli produced by pain, anxiety, hypovolaemia and the superficial plane of anaesthesia, as they may increase conduction through the accessory pathway and produce arrhythmias. Although most drugs used in anaesthesia are safe in these patients, drugs with a sympathomimetic effect should be avoided or used with caution.

The urgency of treatment of these arrhythmias depends on: if the patient is stable, pharmacological treatment with antiarrhythmics should be considered as the first option; whereas in case of haemodynamic instability, synchronised cardioversion should be performed.

Reference:

Yeap, Tat Boon et al. (2021). "Anaesthetic challenges in a patient with Wolff-Parkinson-White syndrome for orchidectomy." *BMJ case reports* vol. 14,3 e241176.

Learning points: The anaesthetic management of patients with WPW syndrome is a challenge. Proper invasive monitoring, avoidance of sympathomimetic drugs, as well as consideration of possible associated complications are essential.

Perioperative management of patients with ventricular assist devices in non-cardiac surgery

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Background: Ventricular assist devices (VAD) are a key therapeutic alternative in patients with end-stage heart failure. An increasing number of patients with VAD will require non-cardiac surgery, which represents a challenge for anesthesiologists.

Case Report: A 71-year-old male, with Heart Mate III for dilated cardiomyopathy and history of bladder adenocarcinoma, underwent elective transurethral resection of the bladder due to an episode of hematuria and a low-flow VAD alarm in the previous days. Monitoring included electrocardiogram, non-invasive blood pressure (NIBP), pulse oximeter, invasive blood pressure (IBP), central venous pressure, capnography, BIS, INVOS and transesophageal echocardiography (TEE).

Intravenous induction was performed with fentanyl, etomidate and rocuronium, with low-dose norepinephrine support. Maintenance, with sevoflurane.

The patient was connected to mechanical ventilation in volume control mode, programming a FiO2 of 0.5, a PEEP of 5 and a tidal volume of 7 ml/kg. During surgery, the patient remained stable. Extubation was carried out without complications, and the patient was discharged home on the sixth postoperative day.

Discussion: Preoperative optimization of patients with VADs should be multidisciplinary, with device interrogation, echocardiogram update, discontinuation of anticoagulation with bridging therapy and infection prevention.

Pulse oximetry and NIBP may give erroneous readings due to the continuous flow of the VAD; therefore, monitoring IBP, cerebral oxygenation and serial blood gases are recommended. TEE may also be considered. General anesthesia is preferred, being able to use conventional drugs as long as hemodynamic stability is guaranteed. High doses of fentanyl are recommended at induction to prevent sympathetic discharge during laryngoscopy.

Severe hypovolemia and acute right ventricular failure may progress to potentially fatal suction events. Vasopressors with minimal effects on pulmonary vascular resistance are recommended in cases of hypotension.

Reference:

1. Min, J.-J. et al. (2023) Anesthetic management for non-cardiac surgery in patients with left ventricular assist devices, KJA.

Learning points: Optimal perioperative management of patients with VAD requires anesthesiologists to understand the preload-dependent and afterload-sensitive physiology of these patients, a multidisciplinary approach and the optimization of systemic and pulmonary vascular resistance for proper VAD function.

11AP03-4

From myotonia to the operating table: Crafting care for a complex condition

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Myotonic dystrophy type 1 (DM1) is a multisystemic disorder characterized by progressive muscle weakness and associated complications, including cardiac and respiratory involvement. Anesthesia management in these patients can be challenging and regional anesthesia is preferred.

This report presents a case of a 38-year-old female patient with DM1 affecting distal muscle groups, cognitive impairment, anxiety, and minimal cardiac involvement. She was scheduled for an elective total abdominal hysterectomy with bilateral salpingectomy. Given her neuromuscular disorder, anesthesia was carefully tailored to minimize risks, with reassurance provided throughout. Upon arrival in the operating room (OR), standard ASA monitoring was applied, and multifunction defibrillation pads were placed for rapid access if needed.

Sedation was initially avoided, and an arterial radial line was placed with local anesthesia for blood gas analysis. Preanesthetic administration of 10 mg metoclopramide IV was given to reduce the risk of pulmonary aspiration, and active forced air warming was used to maintain normothermia.

A combined spinal-epidural anesthesia technique was successfully employed with 10 mg of 0.5% hyperbaric bupivacaine intrathecally. Block level was assessed using a pinprick test, achieving a T11 level. Subsequently, 3 mL of 0.75% ropivacaine was administered through the epidural catheter for an adequate block, and propofol TCI was initiated for conscious sedation.

Goal-directed fluid therapy with saline (NaCl 0.9%) was used. Despite these measures, the patient became anxious and uncomfortable due to positioning, prompting the initiation of general anesthesia with propofol and remifentanil TCl for induction and maintenance.

Intubation was performed without the need for muscle relaxants, and no complications occurred. Serial blood gas tests revealed no significant electrolyte imbalances. Postoperatively, the patient recovered from anesthesia without significant complications, although mild shivering occurred, which was controlled with IV metamizole magnesium.

She was transferred to the intensive care unit (ICU) for monitoring and recovery. This case highlights the complexities of managing DM1 patients undergoing surgery.

Careful perioperative planning is essential for a safe outcome. Despite stable cardiac function, the patient's neuromuscular condition required precise attention to anesthesia and recovery protocols to minimize complications and ensure optimal care.

Effect of methadone compared to morphine on the quality of anesthetic recovery after abdominoplasty

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Background and Goal of Study: This study aimed to analyze the effect of methadone compared to morphine as a component of multimodal analgesia during the intraoperative period regarding the quality of postoperative recovery in patients undergoing abdominoplasty.

The objective was to demonstrate that methadone, although underutilized in surgical settings, offers potential benefits for these patients.

Materials and Methods: This prospective, parallel, randomized, double-blind, controlled clinical trial included 40 patients undergoing abdominoplasty surgery. Participants were divided into two groups of 20 individuals each: one group received methadone, and the other received morphine during the intraoperative period as part of the anesthetic protocol.

All surgeries were performed by the same surgical team using a standardized technique. The anesthetic protocol was identical for all, differing only in the opioid used.

Twelve hours post-surgery, participants completed the QoR-40 questionnaire to assess aspects of comfort, emotions, pain, physical independence, and support. Medical record data were also analyzed.

This study was approved by an Independent Ethics Committee (protocol number: 67775323.7.0000.5351). Data normality was analyzed using the Shapiro-Wilk test, followed by the appropriate t-test based on the data's normality.

Results and Discussion: The global QoR-40 score 12 hours postsurgery was higher in the methadone group (mean: 181.6) compared to the morphine group (mean: 171.4). The methadone group also showed higher mean scores across all subdomains of the questionnaire except for the support subdomain.

Nausea and vomiting rates were significantly lower in the methadone group. Specifically, 5% of methadone participants experienced vomiting and 50% experienced nausea, compared to 40% vomiting and 70% nausea in the morphine group.

When vomiting was scored on a scale from 1 (never) to 5 (all the time), the methadone group had an average score of 1.050, while the morphine group scored 1.950 (p = 0.0074).

In the post-anesthesia care unit, methadone patients showed a shorter average length of stay and required a lower cumulative dose of rescue morphine. No cases of respiratory depression were observed in either group.

Conclusion(s): Methadone, when compared to morphine, is associated with better postoperative recovery outcomes, particularly in reducing the incidence of nausea and vomiting.

11AP03-6

Successful anaesthetic management with remimazolam under thoracoscopic subtotal esophagectomy: two case reports

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Background: Esophagectomy typically requires a prolonged anaesthetic duration, leading to increased consumption of volatile anaesthetics, which contributes to global warming. To our knowledge, no reports in English have documented the use of remimazolam (RMZ) for esophagectomy.

Here, we present two successful cases of anaesthetic management using RMZ during thoracoscopic subtotal esophagectomy. Case report:

Case 1. A man in his 70s was diagnosed with thoracic oesophageal cancer. He underwent esophagectomy with lymph node resection. To minimise invasive effects on the recurrent nerves, a nerve integrity monitor tube was inserted, and RMZ was administered to reduce its impact on evoked potentials. The operation lasted 577 min. RMZ was transitioned to propofol upon admission to the intensive care unit (ICU). The patient was extubated the next day after confirming an adequate cough reflex using bronchoscopy. On postoperative day (POD) 5, he was discharged from the ICU with no respiratory complications.

Case 2. A woman in her 40s underwent a total gastrectomy for gastric cancer. A subsequent pathological diagnosis revealed residual cancer in the lower oesophagus, necessitating additional esophagectomy. The patient was extubated in the operating room because lymph node resection around the recurrent nerves was not indicated. The operation lasted 530 min. After 20 min of discontinuation of RMZ, prompt awakening was achieved, and the patient was extubated in the operating room after reversal with 0.25 mg of flumazenil. She was discharged from the ICU on ROD 2

In both cases, epidural anaesthesia was administered. General anaesthesia was induced using RMZ, fentanyl, and rocuronium, with maintenance achieved through continuous RMZ and remifentanil infusions. Bispectal Index monitoring was maintained between 40 and 60. A bronchial blocker was used for one-lung ventilation after intubation. Neither patient experienced post-operative delirium or agitation.

Discussion: RMZ is a short acting benzodiazepine that facilitates rapid awakening with flumazenil. Additionally, a case series suggests that RMZ use may result in slightly higher motor-evoked potential amplitudes compared to propofol anaesthesia [1].

References:

1. Yamada S, et al. The intraoperative motor-evoked potential when propofol was changed to remimazolam during general anesthesia: a case series. J Anesth. 2023;37(1):154-159.

Learning points: RMZ can be a viable alternative anaesthetic for esophagectomy.

What to expect when you are not expecting: a case report of sciatic neuropraxia after Total Knee Replacement

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Background: Intraoperative iatrogenic nerve injury can be multifactorial. Sciatic nerve injury, although rare, is a significant complication following total knee replacement (TKR), requiring prompt diagnosis and management due to its critical role in lower limb function.

Case Report: A 77-year-old female was admitted for a left TKR due to severe osteoarthritis without previous neurological deficits. She had asthma and systemic hypertension and was graded American Society of Anesthesiologists class III.

Spinal anesthesia was administered at the L4-L5 level using a 27G Whitacre needle, with intrathecal administration of 9 mg of 0.5% bupivacaine and 1.5 mcg of sufentanyl. Intra-articular infiltration with 300 mg of ropivacaine, 1 mg of adrenaline, and 30 mg of ketorolac in 100 ml saline was performed for analgesia besides multimodal analgesia. The surgery lasted 90 minutes and was uneventful. The tourniquet remained in place for 70 minutes.

On postoperative day 1, the acute pain team observed reduced knee flexion and extension, plantar flexion, and absence of dorsiflexion, inversion, and eversion in her left foot. A neurological evaluation confirmed sciatic neuropathy, and electromyography (EMG) was recommended in 2-3 weeks.

One month later, EMG revealed no abnormal resting activity or dysfunction in the peroneal and tibial nerves, suggesting sciatic neuropraxia with a good prognosis. At her 2-month follow-up, the patient showed significant improvement of neurological deficits. The sciatic neuropathy was likely caused by a combination of stretching, compression and ischemic injury.

Discussion: Sciatic neuropathy is a rare complication of knee replacement surgery. It may arise from inflammatory, mechanical, ischemic, or anesthesia-related factors (such as peripheral nerve blocks), often linked to positioning, surgical manipulation and prolongued tourniquet time.

Although uncommon, understanding the pathophysiology, risk factors, and preventive measures for nerve injuries in TKR is crucial for optimal management and patient care.

References:

Yoon, S. J. (2018). https://doi.org/10.1186/s12891-018-2091-x Yacub, J. N. (2009). https://doi.org/10.1097/ PHM.0b013e3181ae0c9d

Learning points: This case provides insights into the potential complications of TKR, reminding healthcare providers to consider uncommon but significant complications and encouraging early intervention for better outcomes.

11AP03-9

Evaluation of opioid free and opioid based anesthesia techniques for super-obese patients

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Background and Goal of Study: We presented a hypothesis that opioid-free anesthesia (OFA) is equally good as fentanyl anesthesia (FNT) for super-obese patients undergoing bariatric surgery under general anesthesia.

Materials and Methods: The research included 129 patients with BMI of >50 kg/m² undergoing the same surgery, randomly divided to the group receiving FNT or OFA + sevoflurane (OFA+s). The FNT group was randomly divided into receiving sevoflurane (FNT+s) or propofol (FNT+p).

Measurements taken: systolic blood pressure (SBP), diastolic blood pressure (DBP), mean blood pressure (MBP), heart rate (HR), end-tidal carbon dioxide (EtCO₂), blood oxygen saturation (SpO₂).

Test applied for analysis: the Mann-Whitney U test for independent data and the Wilcoxon signed-rank test for paired data.

Results and Discussion: SBP values significantly decreased between induction and the first measurement across all groups: FNT+s from 150.0 to 100.0 mmHg, FNT+p from 155.0 to 121.0 mmHg, and OFA from 137.5 to 120.0 mmHg.

A similar decrease was observed in the FNT+s group as in the OFA+s group. Significant disparities were noted between the FNT+s and FNT+p groups: 50.0 vs. 28.0 mmHg.

The OFA+s group presented the most stable SBP. FNT+s and OFA+s groups had greater DBP stability, as the FNT+p group had larger fluctuations. MBP presented a similar trend. HR decreased significantly in all groups after anesthesia induction. It was lowest in the FNT+p group: 81.0 vs. 79.0 (/min). In the FNT+s group it dropped from 83.0 to 70.0, and in the OFA+s group it lowered from 90.0 to 80.0.

HR stability across two following measurements after induction had the smallest difference in the OFA+s group (2 beats/min), a moderate difference in the FNT+p group (3.5 beats/min), and the largest in the FNT+s group (6 beats/min). SpO $_2$ increased between induction and the first measurement (largest in the FNT+p group, smallest in the FNT+s group), then decreased in the next two measurements. OFA group had higher SpO $_2$ values compared to both FNT groups. EtCO $_2$ had more stable values in the OFA group than in the FNT groups. Patients of FNT+s group required a lower dose of fentanyl compared to FNT+p group: 0.037 vs. 0.047 $\mu g/kg/min$.

Conclusion(s): OFA+s provides stable conditions for bariatric surgery in super-obese patients. Fentanyl-based anesthesia gives more stable conditions with sevoflurane compared to propofol. Moreover, sevoflurane significantly reduces fentanyl consumption.

Post-operative Atypical Carcinoid Crisis: a rare but critical complication

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Background: Carcinoid syndrome (CS) is a rare paraneoplastic condition caused by the release of hormones like serotonin by Neuroendocrine Tumors (NET). It typically presents with diarrhea, flushing, and hypotension. Carcinoid crisis (CC), a life-threatening form of CS, is triggered by sudden mediator release, often due to tumor manipulation, stress, or anesthesia.

There is a wide array of associated features ranging from flushing and labile tension to bronchospasm and life-threatening arrhythmias. We present an atypical CC case to raise awareness about its diagnosis, treatment, and prevention.

Case Report: A 46-year-old man with known stage IV intestinal NET was admitted for bowel obstruction and underwent urgent enterectomy and partial colectomy under TIVA and thoracic epidural anesthesia.

Surgery proceeded without complications, and the patient emerged stable. In the PACU, he developed refractory hypertension, hyperthermia, and abdominal pain. Suspecting atypical CC, a bolus of octreotide (500ug) was administered. A subsequent perfusion of octreotide was initiated and clinical stabilization was achieved.

He was then transferred to the ICU, where CC was confirmed, and treatment with octreotide and antihypertensives continued. By day 3, BP normalised, and he was moved to the ward, later being discharged home.

Discussion: CC is a rare and critical event, with limited data available. This case is especially unusual, as CC manifested postoperatively with hypertension and hyperthermia rather than hypotension. This case highlights the wide array of CC presentations, underscoring the importance of prompt recognition and management.

Anesthetic care is challenging due to unpredictable perioperative behavior, emphasizing the need for thorough monitoring (invasive BP, temperature), maintaining normothermia, avoiding triggering drugs, and using additional octreotide prophylactically or therapeutically.

In this case, earlier octreotide use may have prevented CC, as it effectively stabilized BP when administered.

Learning points: Anesthetic management of patients with associated NET can be quite challenging and should include a thorough preparation of all the perioperative settings.

Specific protocols guiding the management of these patients should be available and early suspicion is of the utmost importance.

Reference:

Jonathan R Strosberg, MD, Treatment of the carcinoid syndrome, in UpToDate, Connor RF (Ed), Wolters Kluwer. Accessed November 10th 2024

11AP03-11

Non-cardiac urgent surgery in patients with partial repaired atrioventricular canal defect: a case report

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Background: The survival rate of people born with congenital heart defects has increased with nearly 90% of patients reaching adulthood and requiring non-cardiac surgeries throughout their lives. We present a patient with a complete atrioventricular canal defect (AVCD) who underwent an urgent appendicectomy.

Case Report: A 24-year-old woman proposed for urgent laparoscopic appendectomy. The patient had a history of visceral heterotaxy and a complete AVCD with a single atrium and a large ventricular septal defect, which has been partially corrected: a pulmonary binding and a connection between the superior vena cava and the right pulmonary vein during her first year and at 13 years old a connection between the inferior vena cava and the right pulmonary vein (Fontan).

Arriving to the operating room, the patient was hemodynamically stable with 92% oxygen saturation on ambient air, proBNP 176pg/mL with hepatic congestion on the CT scan and a recent cardiac hemodynamic without signs of pulmonary hypertension.

Before induction, the left radial artery was catheterized and filters were placed in all intravenous access to minimize air embolism. General anesthesia was performed with rapid sequence induction. Pneumoperitoneum was maintained at low pressure rates (9-11cmH2O) with a PEEP of 5cmH₂O and a Vt of 420mL.

During surgery, ventricular function and blood volume were monitored using transesophageal echocardiography (TEE). The surgery and postoperative period in PACU proceeded without complications.

Discussion: Adults with congenital heart disease are at potential risk for cardiac complications. Before surgery, it is important to exclude signs of congestive heart failure and pulmonary hypertension.¹

Single ventricle patients rely on volume and high heart frequencies to keep a normal cardiac output. Intraoperatively, it is crucial to adjust monitoring as well as anesthesic and analgesic drugs to prevent changes in blood pressure and use filters to deair intravenous lines.

The TEE plays a major role providing a non-invasive cardiac function information although it might be difficult in patients with altered anatomy.Low intrathoracic pressure is important to avoid left-right shunt, working with low PEEP and intraabdominal pressure.

Communication with the surgical team helps to prevent avoidable complications.

References:

1. Semin Cardiothorac Vasc Anesth. 2017;21(3):221-228.

Learning points: Anesthesia for non-cardiac surgery in congenital heart patients.

Do the neuromonitoring depth of anesthesia and neuromuscular monitoring have impact on the quality of recovery after general anesthesia?

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Background and Goal of Study: Quality of recovery after general anesthesia are complex, multi-dimensional parameters. This study aimed to compare the overall quality of recovery following general anesthesia after major abdominal operations guided by advanced monitoring techniques-bispectral index (BIS) and Train of Four (TOF) for neuromuscular monitoring and without that monitoring. The Quality of Recovery-40 (QoR-40) questionnaire was used as a psychometric instrument designed to quantify postoperative recovery with validate Croatian version and its correlation with hand grip strength.

Materials and Methods: An observational comparative study was conducted on two groups. Patients were randomly assigned in Group A and B. Group A underwent anesthesia guided by BIS and TOF, while Group B was guided by hemodynamic parameters. Hand-grip muscle strength was measured with a dynamometer: before general anesthesia and 24 hours after extubation. The quality of patient recovery was assessed with a Qor-40 questionnaire 24 hours after extubation.

Results and Discussion: The study included 50 participants, age 37-86, ASA 1-3. Female made 46% of the participants and men 54%, average BMI was 27 in both groups. The average duration of the operation was 3 h and 20 min.

Figure 1. shows the responses to the QoR questionnaire and figure 2. shows the results of grip strength measurements.

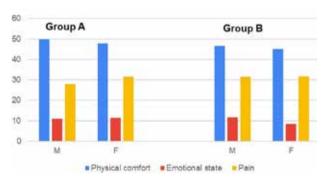


Figure 1. QoR-40 questionnaire among groups.

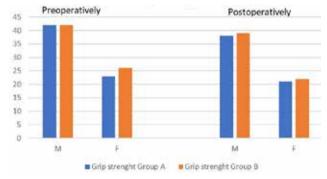


Figure 2. Grip strength.

Conclusion(s): Quality of recovery after general anesthesia and surgery is wide concept that seeks to assess recovery from the patient's perspective and is a patient-reported measurement. Hand grip strength is commonly used to measure voluntary muscle function as an indicator of muscle strength and postoperatively recovery after different surgeries.

This study did not show a significant difference between groups in the quality of recovery after general anesthesia despite BIS and TOF monitoring.

11AP04-1

Optimizing anesthetic management in latex-allergic patients: a case report of urethroplasty with a latex-free protocol

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Background: Latex allergy, an immunological reaction to natural rubber proteins, remains a critical challenge in perioperative care. While its incidence is declining due to better identification of at-risk patients, latex in surgical materials remains a significant risk ¹.

Ensuring a latex-free environment is paramount to prevent hypersensitivity reactions, especially in high-risk settings like urologic surgery.

Case Report: A 57-year-old male with confirmed latex allergy, obstructive sleep apnea, and grade I obesity underwent oral mucosa graft urethroplasty. After detailed risk assessment using a validated screening questionnaire, a latex-free protocol based on hospital guidelines was implemented. Preparations included patient isolation, removal of latex-containing materials, and substitution with latex-free alternatives such as silicone catheters and nitrile gloves.

The procedure was scheduled as the first of the day to reduce latex aeroallergen exposure. Anesthesia equipment was adapted, including latex-free airway devices, and precautions were taken with medication preparation to avoid cross-contamination.

The patient was closely monitored perioperatively for hypersensitivity reactions. The surgery was completed successfully without allergic or anesthetic complications, underscoring the protocol's effectiveness.

Discussion: This case highlights the effective application of an institutional latex-free protocol. Early identification of allergy risk, strict operating room preparation, and team coordination were key. Literature supports such protocols as essential for reducing hypersensitivity risks and ensuring patient safety.

Premedication with antihistamines or corticosteroids can attenuate mild reactions but is not a substitute for preventive measures².

References:

1. Hepner, D. L., & Castells, M. C. (2003). Latex allergy: an update. Anesthesia and analgesia, 96(4), 1219–1229. https://doi.org/10.1213/01.ANE.0000050768.04953.16

2. Ahmed, S., & Savic, L. (2020). Latex: a rare but important cause of perioperative allergic reactions. BJA education, 20(12), 398–399. https://doi.org/10.1016/j.bjae.2020.08.002

Learning points: The successful management of this case validates the efficacy of the hospital's latex-free protocol in addressing the challenges of latex-allergic patients in perioperative set-

tings. The approach highlights the importance of standardized, evidence-based practices to optimize safety and improve outcomes in high-risk surgical scenarios.

11AP04-2

Autistic adult with pneumonia and suspected radial nerve injury: an anesthesic challenge

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Background: Autism, usually viewed as a pediatric condition, affects 1-2% of adults. The authors describe a case of an autistic uncooperative adult with extreme agitation, pneumonia and an upper limb fracture with suspected radial nerve injury in need of urgent surgery.

Case Report: 34-year-old autistic man with psychomotor agitation and community-acquired pneumonia was admitted due to a humeral fracture with radial nerve paralysis. The patient was agitated and uncooperative, with self-aggressive behaviour upon arrival at the operating theater.

An intramuscular injection of 1mg/kg ketamine + 1 mcg/kg dexmedetomidine was administered to sedate the patient and minimize the risk of airway compromise during transport to the operating room.

Upon arrival, the patient was monitored according to ASA standards, BIS and TOF, peripheral catheterization was possible and a general balanced anesthesia was administered, combined with a multimodal analgesia.

Ventilation parameters were carefully chosen for a protective ventilation and SpO2 >95%. Two recruitments were made, one after induction and one before extubation. The surgery was uneventful, and the patient woke up calm, maintaining 92-94% SpO2 with 28% O2 supply.

Discussion: Autism affects interaction, communication, and perception, often coexisting with other medical conditions.

In this case, regional anesthesia was not an option due to a high suspicion of radial nerve injury with need for intraoperative electrostimulation. So, although a general anesthesia could substantially worsen the respiratory condition due to the presence of community-acquired pneumonia, with need for prolonged invasive airway management, it was a necessary risk to take.

The authors believe that this case highlights the importance of knowing how to adapt the anesthetic strategy to the challenges that arise, always considering the risks and how to minimize them. **References:**

1. Anesthesiology, 92(5), 1467–1472. doi:10.1097/00000542-200005000-00037.

2. *BMC* anesthesiology, 19(1), 153. doi:10.1186/s12871-019-0804-9. **Learning Points:** Autism affects all ages and influences medical decisions. It is essential to use pre-anesthetic medication that can adequately sedate a patient reducing anxiety and trauma and maintaining patient safety.

Protective ventilation and recruitment maneuvers are fundamental for managing acute or chronic lung disease intraoperatively.

11AP04-3

Case Report of a Post-Right Pneumonectomy Patient undergoing Laparoscopic Cholecystectomy

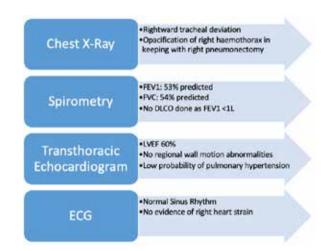
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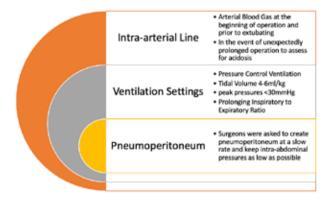
Background: Pneumonectomies significantly impact respiratory and cardiovascular systems. Right pneumonectomies cause greater reduction in lung volume with mortality rates thrice that of left. There are limited reports on these patient undergoing laparoscopic surgeries. Laparoscopic approaches reduce pain and length of hospital stay but capnoperitoneum causes further compromise to the cardiorespiratory system.

This case report discusses anaesthesia considerations of a postpneumonectomy patient undergoing laparoscopic cholecystectomy

Case Report: 69 year-old female required laparoscopic cholecystectomy 23 years after a right pneumonectomy. Pneumonectomy was done due to post-tuberculosis bronchiectasis and recurrent infections complicated by complete bronchial occlusion. Pre-operative assessment of her cardiorespiratory status are summarised:



Intra-operative considerations included use of invasive monitoring, lung protective ventilation strategies and minimization of pneumoperitoneum pressure.



She was sent to high dependency for aggressive chest physiotherapy and recovered uneventfully. **Discussion:** With improved healthcare and life expectancy, there are more post-pneumonectomy patients presenting for laparoscopic cholecystectomies. There is a need for more reports on perioperative management for this patient group.

References:

Kumar, S. et al. (2022) Anesthetic considerations for elective laparoscopic cholecystectomy in a patient with previous pneumonectomy, Cureus

Santha, N., Govind, L. and Naik, S. (2021) Laparoscopic appendicectomy in a postpneumonectomy patient, Annals of African medicine

Learning points: Importance of pre-operative risk assessment, intraoperative invasive monitoring, use of lung protective ventilation strategies, communication with surgical team as well as aggressive chest physiotherapy post-operation to reduce atelactasis

11AP04-6

Impact of pneumoperitoneum and extreme Trendelenburg position in laparoscopic anterior rectal resection: a case report

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Background: Laparoscopic anterior rectal resection (LARR) risks include pneumoperitoneum-induced increased intra-abdominal pressure (IAP), causing cardiovascular, respiratory, and neurological changes, worsened by extreme Trendelenburg positioning (1). Case Report: A 57-year-old female (65 kg, 160 cm), ASA II, with hypertension and dyslipidemia, was proposed to LARR under balanced general anaesthesia and epidural analgesia. ASA monitoring standards were followed, as well as neuromuscular blockade (NMB), invasive blood pressure, and core temperature monitoring. Epidural catheter was placed at L4-L5 and 20 mL 0.375% ropivacaine plus 2.5 mcg sufentanil was given in boluses, with a final 5 mL bolus of 0.2% ropivacaine. The 7-hour procedure required extreme Trendelenburg and left-side positioning, with a maximum IAP of 12 mmHg. No pauses for positioning or pneumoperitoneum relief were made. Hemodynamic stability was maintained with goal-directed fluid therapy. Following NMB reversal, the patient began spontaneous ventilation but regained consciousness 1 hour after halogenated agent suspension. She was extubated and transferred to the PACU with mydriatic photoreactive pupils and motor blockade in all limbs. Arterial blood gas showed mixed acidosis and type II respiratory failure. Chest X-ray showed obliterated costophrenic angles. Epidural catheter was removed and motor function gradually returned. She was transferred to the ICU and recovered without complications.

Discussion: We attributed the delayed emergence from anaesthesia, neurological findings, and arterial blood gas alterations to prolonged extreme Trendelenburg positioning combined with pneumoperitoneum insufflation. This assumption is supported by the literature, which documents cases of peripheral neuropathy associated with similar conditions (2).

References:

1. Arvizo C, Mehta ST, Yunker A. Adverse events related to Trendelenburg position during laparoscopic surgery: recommendations and review of the literature. Curr Opin Obstet Gynecol. 2018;30:272-8.

2. No MY, Shin JM, Choi WJ. Two cases report of brachial plexus injury in laparoscopic colorectal surgery. Korean J Anesthesiol. 2013;65(6 Suppl):S149-50.

Learning points: Strategies such as limiting IAP and implementing pauses during surgery are important to improve anaesthetic and surgery outcomes.

11AP04-7

The effect of opioid-free anesthesia on the haemodynamic response during laryngoscopy and intubation. a randomized double-blind study

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Background and Goal of Study:Laryngoscopy and endotracheal intubation can provoke a significant haemodynamic response and opioids are commonly used in order to mitigate this. The goal of this study was to assess the effect of opioid-free anesthesia on haemodynamic response parameters during laryngoscopy and intubation

Materials and Methods:This randomized controlled doubleblind prospective study included 70 patients of both sexes, ASA I-II, that were assigned to two groups: OFI (opioid free induction) group received a combination of dexmedetomidine, ketamine and lidocaine prior to laryngoscopy and intubation and OBI (opioid-based induction) group received fentanyl during induction in anesthesia. Haemodynamic parameters were assessed in six different timepoints from baseline up to 5 minutes after intubation.

Results and Discussion:Both groups displayed a significant increase in heart rate (HR) after intubation as compared to pre-intubation values (p<0.001 for both groups). However, in group OFI, this increase persisted only up to 3 min after intubation, whereas, by 5 min after intubation, heart rate had returned to pre-intubation values

In contrast, in the OBI group, the increase in HR was longer lasting since it was still evident 5 min post-intubation. In direct comparison between the two groups, the increase in HR was more prominent in the OFI group in comparison to the OBI group immediately post intubation as well as 1, 3 and 5 min post-intubation (p=0.001, 0.002, 0.033 and 0.043 respectively). Mean arterial pressure (MAP) in group OFI was not affected throughout the study observation period. In contrast, in group OBI, MAP increased immediately post intubation in comparison to pre-intubation values (p=0.007).

Conversely, at 3 and 5 min post intubation, MAP in the OBI group decreased significantly as compared to pre-intubation values (p=0.001 and <0.001, respectively). In direct comparison between the two groups, group OBI displayed lower MAP values 3 and 5 min post intubation as compared to group OFI (p=0.046 and<0.001, respectively).

The incidence of clinically significant hypotension (systolic arterial pressure<70% of baseline) was higher in the OBI group throughout the whole observation period (48.5% vs 17%, p=0.011). **Conclusion:**The increase in heart rate post intubation is of greater magnitude and more pronounced with an opioid-based technique. Additionally, an opioid free technique helps maintaining a more stable MAP in the peri-intubation period.

11AP04-8

The impact of preoperative waiting time on patient safety and outcomes in hip fracture surgery: a retrospective observational study

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Background and Goal of Study: Hip fractures in older adults pose significant safety challenges due to their association with high morbidity and mortality. Preoperative waiting time has been identified as a critical factor influencing patient safety, particularly regarding complications and hospital outcomes.

This retrospective observational study investigates the impact of preoperative waiting time on safety-related outcomes in hip fracture surgery, aiming to inform strategies to optimize care for this vulnerable population.

Materials and Methods: This study included patients aged 65 years or older who underwent hip fracture surgery at a tertiary hospital over the past year. Patients were categorized by preoperative waiting time: <24 hours, 24-48 hours, and >48 hours. Safety-related outcomes, including 30- and 90-day mortality, postoperative medical complications, and hospital length of stay, were analyzed.

Multivariable regression was performed to evaluate the independent effect of waiting time, adjusting for confounding factors such as age, ASA score, fracture type, and surgical technique.

Results and Discussion: The study analyzed 99 patients (77% women, mean age 85.7 years). The average waiting time was 62 hours. Patients with waiting times >48 hours experienced significantly longer hospital stays (20.8 days vs. 13.4 days for <24 hours, p=0.021) and increased postoperative complications (p=0.008), particularly respiratory and urinary issues.

However, no significant association was found between waiting time and mortality (p=0.260). Age was a significant predictor of complications (p=0.002) and extended hospital stays (p=0.022), highlighting its role in safety outcomes. These findings underscore the importance of timely surgery to enhance patient safety (1).

Conclusion(s): Prolonged preoperative waiting times compromise patient safety by increasing the risk of postoperative complications and extended hospital stays, though they do not significantly impact mortality. Early surgery emerges as a key strategy to improve safety in hip fracture management.

While spinal anesthesia is the predominant technique, its impact on safety outcomes remains neutral. Optimizing preoperative processes is essential to safeguarding outcomes in this high-risk population.

References:

 Klestil T et al. Impact of timing of surgery in elderly hip fracture patients: a systematic review and meta-analysis. Sci Rep. 2018 Sep 17;8(1):13933.

11AP04-9

A customized protocol for anesthetic management in TORS

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Background and Goal of Study: Transoral robotic surgery (TORS) combines precision and minimal invasiveness, addressing benign and malignant oropharyngeal pathologies. This study aimed to develop and validate an anesthetic protocol for TORS, focusing on airway management, safety, and complication reduction.

Materials and Methods: The protocol involved preoperative fiberoptic evaluation in high-risk cases, total intravenous anesthesia (TIVA) with propofol and remifentanil, videolaryngoscopy-guided intubation, and dexamethasone for edema prevention. Statistical tests included Fisher's exact and logistic regression ($p \le 0.05$).

Results and Discussion: 22 TORS patients (March–September 2024) were analyzed. Airway management was successful in all cases, with three difficult intubations resolved using advanced techniques (fiberoptic intubation).

A predictive score was created to identify patients requiring protected awakening in the intensive care unit. Non-significant correlation was found between preoperative fiberoptic evaluation and intubation difficulty (p = 0.5534), but a trend toward improved outcomes was observed.

Specifically, 25% of patients who did not undergo preoperative fiberoptic evaluation had difficult intubation, compared to 7.14% of those who had the procedure. Dexamethasone reduced post-operative edema, and tranexamic acid managed bleeding in selected cases.

Bleeding during intubation occurred in 1 out of 3 patients with malignant lesions and in 1 out of 3 patients on antiaggregant therapy, underlining the challenge in managing these cases. TIVA minimized postoperative nausea and vomiting (PONV), enhancing recovery. The predictive score accurately identified patients needing ICU-protected awakening, optimizing patient safety.

Conclusion(s): Our evaluation highlighted the importance of careful patient selection, especially for high-risk patients. The protocol improved safety, reduced complications, and addressed complex airway challenges.

The ICU awakening score provides a step toward personalized anesthetic strategies. Future research should validate findings in larger cohorts and refine high-risk patient management.

11AP04-10 BIS monitoring in deranged cerebral autoregulation

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Background: In our case of BIS monitoring we are demonstrating an unusual relationship between mean arterial blood pressure (BP) and BIS index which could have an impact on correct decision making.

Case Report: The ASA III 75 year old, 70 kg male patient was scheduled for an elective laparoscopic gastrectomy due to cancer. His past medical history was complicated by an ischemic stroke 6 years ago without consequent neurological deficit, chronic arterial hypertension with BP 140/70 mmHg and a congenital absence of the left frontal lobe of the brain. No distinct behavioral, cognitive and emotional disorders were noted on examination.

The surgery was performed under combined general and epidural anaesthesia. Invasive arterial BP monitoring and central venous line were established; CVP was 6 cmH2O. BIS monitoring was also utilized to prevent cognitive impairment. The electrodes were applied according to a manufacturer's manual.

At the start of the surgery, BIS was 60, arterial BP 110/80 (mean 95) mmHg and end-tidal (Et) sevoflurane concentration 2.5%. Aiming for BIS=40, Et concentration of the anaesthetic was increased to 3%. BP became 107/76 (mean 91) mmHg and BIS leveled off at 60. It became obvious that in order to obtain adequate depth of anaesthesia not Et concentration but mean arterial BP should have been raised.

After initiation of norepinephrine infusion at 0.02 mcg*kg-1*min-1 BP was elevated to 130/90 (mean 100) and BIS decreased to 30. Sevoflurane Et concentration was then lowered to expected 1.4 and BIS eventually figured at 40. Further course of action was uneventful.

Discussion: In one study, BIS declined along with hypotension [1]. In our case, however, there was a decrease in BIS with higher mean BP. Most probably, despite non-acute state, autoregulation of cerebral blood flow in this particular patient was impaired, and delivery of not only sevoflurane but also oxygen was linearly dependant upon mean arterial BP.

Reference:

1. Liu X, Nakano M, Yamaguchi A, Bush B, Akiyoshi K, Lee JK, Koehler RC, Hogue CW, Brown CH 4th. The association of bispectral index values and metrics of cerebral perfusion during cardiopulmonary bypass. J Clin Anesth. 2021 Nov;74:110395.

Learning Points: In our opinion, this case highlights the importance of BIS in patients with cerebral blood flow derangement as a tool for monitoring depth of anaesthesia as well as preventing new ischemic events in the brain.

11AP04-11

Identifying and overcoming barriers to pre-operative fasting in adults: a quality improvement project

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Background: Prolonged fasting is associated with negative perioperative outcomes. Our Trust's 2022 audit showed that average fluid fasting times varied 8- 12 hours.

Primary Aims:

- Monitor compliance with national/ local guidelines for preoperative fasting.
- · Identify potential contributors to prolonged fasting.

Secondary Aims:

- Identify areas for improvement in preoperative fasting/ hydration.
- Identify potential events related to prolonged preoperative fasting

Materials and Methods: We did a single centre observational study at Watford General Hospital, by using a 27-point question-naire for data collection over 6-week period. All adults undergoing elective procedures under anaesthesia/ sedation were included. We collected preoperative details from patients, while intra/ post-operative data were extracted retrospectively from the Electronic Patient Records and analysed using Excel spreadsheet.

We also surveyed our Consultants to understand their practice and recommendations for improvement.

Results and Discussion:Observations: - Our Consultant survey showed that although we followed local policies [Stop fluids 2 hours prior to surgery], the median fluid fasting duration 7 hours. Despite offering water to some patients, we did record unfavourable preoperative events in about 40% of patients.

Implementing changes: Based on the Survey, we amended our Trust Preoperative fasting policy. We are now educating patients and their attending nurses/ peers to encourage having clear fluids, i.e., we have introduced 'Sip Till Sent For' policy.

Conclusion(s): Despite following the national guidelines, there is still prolonged fluid fasting duration with unfavourable preoperative events. We have initiated 'Sip Till Sent For' policy and plan to reanalyse once fully implemented.

References:

- Griffin R, King P. Nil By Mouth for Surgical Patients Policy.
 Watford: West Hertfordshire Teaching Hospitals NHS Trust;
 2024 February 20. 9p. Report No.: WHHT: C048 version
 National Institute for Health and Care Excellence.
- 2. Perioperative care in adults [H] Evidence review for preoperative fasting FINAL. United Kingdom: National Guideline Centre; 2020 August. 137p. Report No.: NICE guideline NG180. 3. Rüggeberg A, Meybohm B, Nickel E. Preoperative fasting and the risk of pulmonary aspiration- a narrative review of historical concepts, physiological effects, and new perspectives. BJA

Open 2024 Mar; 10 (C): 1-13. Doi: 10.1016/j.bjao.2024.100282.

11AP04-12

Perioperative management of an adult patient with Prader-Willi syndrome

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Background: Prader-Willi Syndrome (PWS) is a rare disease caused by a deletion on the paternal chromosome 15q11.2-q13 and represents the most common syndromic cause of obesity. Clinically, it is characterized by short stature, hypogonadism, growth hormone deficiency and muscle hypotonia. Behavioral alterations such as hyperphagia lead to severe obesity and associated comorbidities, including obstructive sleep apnea, cardiovascular dysfunction and insulin resistance with type 2 diabetes mellitus as consequence.

Despite the scarcity of reported cases in the literature¹, these factors present unique challenges in the perioperative period, especially in patients with morbid obesity.

Case Report: Here we report the case of a 26-year-old patient with a BMI of 85 and a diagnosis of PWS who underwent endoscopic sleeve gastroplasty and argon plasma coagulation.

Discussion: The surgical procedure was performed under general anesthesia. Induction was achieved with fentanyl, propofol, and rocuronium, with orotracheal intubation facilitated using a videolaryngoscope due to an anticipated difficult airway. A pulmonologist was present to assist with fibroscopy if necessary.

Anesthesia maintenance was achieved with sevoflurane, fentanyl and rocuronium, under standard ASA monitoring. Intraoperative blood glucose monitoring revealed hyperglycemia which was promptly corrected with insulin administration. Antagonism of neuromuscular blockade was achieved with sugammadex, ensuring complete reversal, essential due to the patient's basal hypotonia.

The patient remained hemodynamically stable throughout the procedure and immediately afterwards, with no signs of airway obstruction or delayed emergence from anesthesia.

Postoperative management included close monitoring for respiratory and metabolic complications which exacerbate perioperative risks. The patient was discharged on the first postoperative day following an uneventful recovery.

References:

1. Aravindan A, Singh AK, Kurup M, Gupta S. Anaesthetic management of paediatric patient with Prader-Willi syndrome for bariatric surgery. *Indian J Anaesth*. 2020;64(5):444-445

Learning points: This case highlights the complex interplay of PWS-associated features in the perioperative setting, including severe obesity, altered neuromuscular physiology and metabolic dysregulation.

Careful preoperative evaluation, tailored anesthetic techniques and vigilant postoperative monitoring are critical in optimizing outcomes for these patients.

11AP05-1

Inhalation anesthesia for congenital Steinert Myotonic Dystrophy: two approaches in the same patient

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Background: Myotonic Dystrophy Type 1, the most common of the myotonic syndromes, is an autosomal dominant disorder. Also known as Steinert's Disease, it can represent a serious challenge to the anesthesiologist.

Case Report: A 2-year-old girl, diagnosed with Steinert's dystrophy, was proposed for otolaryngology surgery. Her preoperative assessment revealed generalized hypotonia and a small patent foramen ovale

She first underwent bilateral myringotomy. Anesthesia induction used fentanyl and sevoflurane, without neuromuscular blocking agents. Intubation was successful after an uneventful laryngoscopy. Anesthesia was maintained with sevoflurane, and emergence was uneventful, with extubation after the procedure.

Four months later, she underwent analysis of auditory function using brainstem evoked potentials and myringotomy, with fentanyl and sevoflurane induction, and a supraglottic device placed for maintenance od spontaneous ventilation throughout the surgery. Both surgeries included previous warming of the operating room, analgesia, nausea, and vomiting prophylaxis, and the patient was monitored in the PACU before discharge.

Discussion: Neuromuscular disorders have particularities that concern anesthesiologists.

Firstly, a risk for difficult endotracheal intubation has been described in this syndrome. It is current practice to use intravenous anesthesia due to concern about malignant hyperthermia (MH). However, recent studies show the risk of developing MH is similar to the general population.

Hence, induction and maintenance of general anesthesia with sevoflurane, performed in both surgeries, can be advantageous, enabling spontaneous ventilation until the airway is secured.

Additionally, increased sensitivity to neuromuscular blocking agents and opioids can lead to postoperative respiratory muscle insufficiency, making preoperative muscle disability assessment crucial, which may be challenging in the pediatric population.

Hence, a prolonged PACU stay for monitoring is essential.

Fortunately, the physiological stress leading to hypotonia was not an issue, as these were two short surgeries with minimal blood loss and pain stimuli, where hypothermia could be easily prevented.

Learning Points: Congenital Steinert's disease is a rare myotonic syndrome. This case report demonstrated that, for this syndrome, the use of volatile anesthesia is a possibility. Perioperative monitoring for ventilatory failure is required.

11AP05-2

A novel online monitoring scheme of propofol – rapid evaluation of anesthetic effects via exhaled propofol

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Background and Goal of Study: Exhaled propofol monitoring has not been widely adopted to assess anesthesia depth or guide dosing due to a lack of efficient methods for real-time evaluation of its pharmacodynamic effects, including sedative and cardiovascular responses.

This study evaluates a non-invasive approach using ultraviolet-photoionization time-of-flight mass spectrometry (UV-TOF-MS) to rapidly determine anesthesia depth and hemodynamic effects via exhaled propofol concentrations.

Materials and Methods: Thirty-six mechanically ventilated beagle dogs were anesthetized with propofol administered either as a single bolus group (3, 5, or 10 mg/kg) or continuous infusion group (0.3, 0.5, or 0.7 mg/kg/min). UV-TOF-MS was used to measure exhaled propofol concentrations in real-time, with bispectral index (BIS), mean arterial pressure (MAP), and heart rate (HR) as pharmacodynamic indicators. The correlations between exhaled propofol and bispectral index (BIS), mean arterial pressure (MAP) and heart rate (HR) were evaluated.

Results and Discussion: UV-TOF-MS demonstrated ultra-fast response and high-resolution spectrograms. Moderate to strong negative correlations were observed between exhaled propofol and BIS under single bolus groups (3, 5, or 10 mg/kg) with r reached -0.3847 to -0.7069 (all p < 0.0001) and continuous infusion groups (r = -0.7237 to -0.5322, all p < 0.0001, except r = -0.1474 for the highest dose).

Similar correlations were noted between exhaled propofol and MAP (r = -0.6444 to -0.9178) and HR (r = -0.4413 to -0.8343). However, weak associations with r= -0.1463 (P <0.0001) were observed at the highest continuous infusion rate (0.7 mg/kg/min). **Conclusion(s):** UV-TOF-MS has emerged as a promising technology for real-time monitoring of exhaled propofol. The observed correlations of exhaled propofol levels not only with BIS (Bispectral Index) values but also with blood pressure highlights its potential for efficiently tracking anesthesia depth and hemodynamic effects. This advancement provides a promising pathway for personalized anesthesia management of propofol in clinical settings.

Reference:

Eleveld DJ, Colin P, Absalom AR, Struys M. Pharmacokinetic-pharmacodynamic model for propofol for broad application in anaesthesia and sedation. Br J Anaesth 2018; 120: 942-59. 10.1016/j.bja.2018.01.018

11AP05-3

Preoperative Anxiolysis and Treatment Expectation (PATE Trial): Open-label placebo treatment to reduce preoperative anxiety in female patients undergoing gynecological laparoscopic surgery – A bicentric, prospective, randomized-controlled trial

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Background and Goal of Study: Preoperative anxiety affects nearly half of all surgical patients and often leads to poorer outcomes, including delayed recovery. While sedatives are often used to address anxiety, they have side effects and debateable efficacy, leaving a gap for alternative approaches. Open-label placebos (OLPs) provide a way to harness placebo effects by enhancing positive treatment expectations, where patients consent to taking a placebo¹.

This study aims to determine whether OLPs can effectively reduce preoperative anxiety and to investigate whether their effects can be amplified through social learning.

Materials and Methods: This ongoing bicentric randomized controlled trial (see study protocol²) plans to enroll 120 gynecological patients undergoing laparoscopic surgery.

In this interim analysis, 65 participants were randomly assigned to one of three groups: (1) a control group receiving treatment as usual (TAU, n=21), (2) an OLP group (n=21), and (3) an OLP+Video group (n=23), which added a video featuring a patient perspective about OLPs.

Anxiety was measured preoperatively using a numeric rating scale (NRS, 0 = not anxious to 10 = very anxious).

Secondary outcomes included postoperative pain and patients' acceptance of OLPs.

Results and Discussion: Preliminary findings reveal that anxiety levels were lowest in the OLP group (3.5 \pm 1.9), followed by the OLP+Video group (4.1 \pm 3.1), and highest in the TAU group (5.2 \pm 3.2). While these differences are not statistically significant, the current sample size is likely insufficient to detect small-to-moderate effects.

Notably, patient acceptance of OLPs was very high: 74% indicated they would use OLPs again in a similar situation, and 86% would consider them for other conditions, such as pain or sleep disturbances. The results suggest the potential acceptability of leveraging targeted placebo effects in perioperative care.

Conclusion(s): OLPs offer a novel and patient-centered approach to addressing preoperative anxiety. While awaiting final results, this trial aims to contribute to the evidence base for OLPs, potentially supporting their integration into perioperative care, particularly for patients with contraindications to sedatives.

References:

- 1. Buergler S et al. Sci Rep. 2023;13(1):11827.
- 2. Wessels J et al. Front psychiatry. 2024;15:1396562.

Acknowledgements: The work is funded by the German Research Foundation -Project-ID 422744262 -TRR 289.

11AP05-4

Retrospective observational study comparing the combination of granisetron and dexamethasone vs. ondansetron and dexamethasone as prophylaxis in patients at high risk for PONV undergoing orthopedic surgeries

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Background and Goal of Study: Postoperative nausea and vomiting (PONV) is the 2nd most common complaint following surgery. According to the 4th Consensus Guidelines for the Management of Postoperative Nausea and Vomiting the literature on combination of 2 or more antiemetics for the prevention of PONV is robust and shows superiority over single agents for most studies (evidence A1). Granisetron is considered a more effective and potent antiemetic than Ondansetron.

Our aim of conducting this study was to compare the subgroups of Ondansetron vs Granisetron in combination with Dexamethasone

Materials and Methods: A retrospective study was conducted on 60 patients undergoing an orthopaedic surgical procedure under general anaesthesia. Main inclusion criteria was Apfel score 3 or above. Patients were divided into two groups of 30 individuals each. Just after induction of general anaesthesia, each patient received Inj. Dexamethasone 4 mg iv plus at the end of surgery approximately 30 minutes before extubation, they received either Ondansetron 4 mg iv or Granisetron 1 mg iv. A balanced anaesthetic technique was used for all patients.

Patients were assessed for episodes of nausea, retching, vomiting, and the need for rescue antiemetics at intervals of 1, 6 and 24 hours after surgery. Incidence of complete response and adverse effects were assessed at 24 hours postoperatively. Data was tabulated and subjected to statistical analysis using the chi-square test, unpaired t-test, or the Mann-Whitney U-test as appropriate. A P-value less than 0.05 was considered statistically significant.

Results and Discussion: There was no statistically significant difference between the two groups for incidence of PONV or the need for rescue antiemetic.



Conclusion(s): Combination therapy should consist of drugs from different classes, using minimum effective doses, and the choice of drugs will be determined by patient factors as well as institutional policy and drug availability. However, larger studies are needed on this subject.

11AP05-5

A case report of Kounis syndrome type I triggered by sugammadex administration

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Background: Kounis syndrome (KS) is a rare type of anaphylaxis involving acute coronary syndrome triggered by allergic reactions. It occurs when inflammatory mediators from an allergic response affect coronary arteries and is classified into four types based on the underlying mechanism. Type I is characterized by coronary artery spasm without pre-existing coronary artery disease.¹

Case Report: We report a case of Type I KS following the administration of sugammadex, a reversal agent for rocuronium-induced neuromuscular blockade. The patient, a 66-year-old male, 161cm, 54kg, was under treatment for hypertension, hyperlipidemia, and hyperuricemia. His medical history included a valacyclovir allergy and a smoking history of 20 cigarettes/day for 15 years but no evidence of coronary artery disease, electrocardiogram (ECG) abnormalities, or exercise intolerance.

He was scheduled for transurethral resection of a bladder tumor. General anesthesia was induced and maintained under deep neuromuscular blockade with rocuronium to prevent adductor muscle contraction. Neuromuscular reversal was achieved with 250 mg of sugammadex, and extubation was performed.

Shortly after extubation, the patient's systolic blood pressure dropped to 50 mmHg, followed by a marked ST-segment elevation on ECG. The patient's consciousness is clear, showing no skin or respiratory symptoms indicative of anaphylaxis.

However, he remained unresponsive to vasopressors, including phenylephrine and norepinephrine, and progressed to complete atrioventricular block.

Preparations for temporary pacing and circulatory support were initiated. Based on the presence of suspected drugs and hypotension, KS was considered. Administration of adrenaline, antihistamines, and corticosteroids led to rapid improvement in hemodynamic and ECG parameters.

Coronary angiography revealed no abnormalities, and intradermal testing confirmed hypersensitivity to sugammadex, resulting in a diagnosis of Type I KS.

Discussion: The incidence of anaphylaxis associated with sugammadex is reported to be 0.0029-0.039%, with cardiac arrest in KS cases occurring in 6.3%²⁾, highlighting the importance of prompt and effective management.

In this case, rapid diagnosis and therapeutic intervention ensured a favorable outcome.

Reference:

1. J. Clin. Med, 13, 1647. 2024 2) Int J Car, 232p1-4, 2017

Learning points: Clinicians should consider the possibility of KS when anaphylaxis occurs and adjust management strategies accordingly.

11AP05-6

Comparison of epidural morphine versus epidural dexamethasone for postoperative analgesia following lumbar discectomy: a double blinded, randomised control study

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Background and Goal of Study: Effective postoperative pain management is critical for recovery following lumbar discectomy. Intravenous opioids, though effective, are associated with delayed recovery and prolonged hospital stays.

This study evaluates the comparative analgesic efficacy and safety of gelfoam soaked with epidural morphine versus dexamethasone.

Materials and Methods: This prospective, double-blinded, randomized controlled trial included 60 patients undergoing singlelevel lumbar discectomy. Participants were randomized into two groups: Group M (gel foam soaked with 3 mg of morphine) and Group D (gelfoam soaked with 8 mg of dexamethasone).

The primary outcome was the time to first rescue analgesia within the first 48 hours postoperatively. Secondary outcomes included pain intensity assessed via Visual Analogue Scale (VAS), total rescue analgesic requirement, and adverse events. Pain and sedation scores were recorded at predetermined intervals (0, 6, 12, 18, 24, 36, and 48 hours).

Results and Discussion: Group M showed a longer mean time to first rescue analgesia (26 ± 12 hours) compared to Group D (19 ± 6 hours), though this difference was not statistically significant (p=0.3). Pain scores were significantly lower in Group M at 48 hours (p=0.006), with a trend toward lower scores at earlier time points. The need for rescue analgesia was significantly lower in Group M at 18 hours (p=0.049).

The proportion of patients with complete response (minimal/no pain and no rescue analgesia) was higher in Group M (83%) compared to Group D (57%; p=0.02). Both groups showed minimal adverse effects, with only one episode of nausea in Group M.

Conclusion(s): Gelfoam soaked with epidural morphine provides superior analgesia compared to dexamethasone, evidenced by lower pain scores, reduced rescue analgesia requirements, and higher complete response rates over 48 hours postoperatively. This method is safe and demonstrates a sustained analgesic effect, making it a valuable option for postoperative pain management in lumbar discectomy patients.

References:

- Mugabure Bujedo B. A clinical approach to neuraxial morphine for the treatment of postoperative pain. Pain Res Treat. 2012;2012;612145
- 2. Kundra S, Gupta V, Bansal H, et al. Comparative study of epidural application of morphine versus gelfoam soaked in morphine for lumbar laminectomy. J Anaesthesiol Clin Pharmacol 2014;30:46-52.

Acknowledgements: Dr Narender Kaloria, Assistant Professor

11AP05-7

Case report: Cervical subcutaneous emphysema and hypercarbia as complications of laparoscopic surgery – Challenges in recognition and management

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Background: Subcutaneous emphysema (SE) is a rare complication of laparoscopic surgeries, with an incidence of 0.43%–2.3%¹. It occurs when gas escapes into soft tissues during pneumoperitoneum. Although often benign, massive SE can be life-threatening.

Case Report: A 59-year-old female, ASA II, underwent elective laparoscopic subtotal gastrectomy. Preoperative vital signs were stable: SpO_2 99%, pulse 76/min, and blood pressure 126/85 mmHg. Total intravenous anesthesia was performed with rapid sequence induction.

Protective lung ventilation was used (tidal volume of 6 mL/kg, with permissive hypercapnia, PEEP of 6 cmH20), reaching peak inspiratory pressure of 19 mmHg, and EtCO₂ of 34-36 mmHg.

After one hour, EtCO₂ progressively increased to 62 mmHg. Hypercarbia led to immediate surgical team notification and a procedure pause. CO₂washout measures included increasing respiratory rate and oxygen flow to 10 L/min with FiO₂ at 100%.

The ventilatory system was inspected and found intact. Physical examination revealed extensive crepitus from mid-face to chest. Respiratory acidosis was confirmed via arterial blood gas analysis.

Despite interventions, EtCO₂only decreased to 50 mmHg after 20 minutes. Due to the predicted duration and recurrence risk, the team converted to an open approach, completing it without complications

The patient recovered with stable vitals and EtCO₂ below 45 mmHg. A postoperative chest radiograph ruled out pneumothorax, and SE resolved spontaneously within 24 hours without additional treatment.

Discussion: This case highlights the importance of early detection and management of SE. Intraoperative hypercarbia and crepitus are key indicators. Preventive measures include maintaining low intra-abdominal pressures, optimizing ventilation, and closely monitoring EtCO₂². Prompt conversion to open surgery may be necessary when SE compromises respiratory status.

References:

- 1. Ito K et al. Subcutaneous emphysema associated with laparoscopic or robotic abdominal surgery: a retrospective single-center study. *Surg Endosc. 2024*.
- Aldakhil SK et al. Subcutaneous emphysema and hypercarbia in laparoscopic procedures: case report. J Surg Case Rep. 2020.
 Learning points: Subcutaneous emphysema during laparoscopy can escalate to airway or respiratory compromise if unrecognized.

Vigilance in intraoperative monitoring and early recognition of hypercarbia and crepitus are critical.

Proactive measures and conversion to open surgery may prevent severe complications.

11AP05-8

Electroconvulsive therapy in patient with ascending aortic aneurysm: a case report

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Background: Electroconvulsive therapy (ECT) is widely accepted as one of the most effective therapeutic interventions for a wide range of psychiatric disorders1.

Activation of the autonomic nervous system, triggered by the administration of an electrical current to the brain under general anaesthesia, can precipitate a tachycardia and hypertension as much as 20-40% above its baseline².

Case Report: We present the case of a 65 year old patient with severe depression who presented for ECT treatment in our institution with a known ascending aortic aneurysm of 4.4cm.

While the risk of aneurysmal rupture during the sympathetic surge was recognised, multidisciplinary meetings between cardiothoracic surgeons, perioperative anaesthesiologists and clinical psychiatrists established no precedent amongst our collective clinical expertise.

During this time, the patient's clinical condition worsened significantly and it was decided to proceed. Good blood pressure control was established pharmacologically in the preoperative phase and during treatment with non-invasive blood pressure monitoring. The patient received 8 ECT treatments in total, after which time her clinical condition improved and the treatments were ceased.

Discussion: There is a published review of ECT in 8 patients with unrepaired abdominal aortic aneurysms3 and a case report of successful ECT after an ascending aorta replacement4.

However, there are no published guidelines or case reports of patients with ascending aortic aneurysms undergoing ECT.

Our experience demonstrates that ECT can be a treatment offered to this cohort of patients where life-threatening psychiatric illness persists.

References:

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- 2. Ding Z, White PF. Anesthesia for electroconvulsive therapy. Anesth Analg. 2002; 94:1351-1364
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- 4. Ohya Y, Sakamoto S et al. Safe and Successful Electroconvulsive Therapy After an Ascending Aorta Replacement: A Case Report. J ECT. 2024; Jun 1;40(2):e6-e7 Learning points: With careful multidisciplinary discussion, ascending aortic aneurysm in patients requiring ECT is not an absolute contraindication

11AP05-10 **Multidisciplinary consultation after** hospitalization in the burn unit - A new direction

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As critically ill patients, burn patients are at increased risk of developing disorders after hospitalization in the Burn Unit (BU). In this context, a new multidisciplinary evaluation was created in 2023 at the São José Local Health Unit, by Anesthesiology and Nursing team, the Post-hospitalization consultation in the Burn

Its objectives are: to identify sequelae in the various domains, that condition changes in quality of life: to refer to the necessary clinical areas, and to coordinate with Primary Health Care, in order to optimize recovery, reduce morbidity and re-hospitalization rates. Since the start of this pioneering consultation, 176 patients admitted to the BU between April 2023 and April 2024 were analyzed. The adopted inclusion criteria were: Transfer from the BU > 6m, possible consultation of the clinical file, previous telephone contact. Seventy-one patients were excluded according to the following criteria: Deceased; current hospitalization in long-term care, rehabilitation or hospital; Non-resident foreigners; Patient refusal; 3 failed attempts of contact; neurological condition that prevented assessment and patients transferred to other BU.

Of the 63 patients evaluated in the first consultation, 46 still presented complaints related to the burn, as illustrated in figure 1.

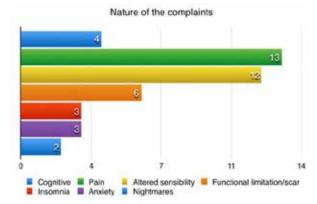


Figure 1. Nature of the identified sequelae complaints.

At the time of the assessment, 13 patients had not received any clinical follow-up, 10 of whom still had complaints associated with the burn and hospitalization. There were 38 patients without clinical referral, the referrals were mostly to chronic pain consultation, psychiatry, neurology and primary care.

The changes resulting from hospitalization lead to a decrease in quality of life and greater difficulty in re-adapting to society. Identifying and monitoring these situations is essential for resolving them and reintegrating the patient into an active and independent lifestyle.

Given the shortage of scientific resources that document the monitoring of this specific population, this is also a crucial opportunity to better adapt and adapt the individualized clinical situation of hospitalized patients to the pharmacological and methodological choices currently used.

11AP05-11

Are there differences in the outcomes of the ERAS colorectal pathway based on the level of compliance?

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Background and Goal of Study: Enhanced recovery after surgery (ERAS*) pathways have been proven to improve postoperative recovery, reduce morbidity and length of stay (LOS) after colorectal surgery. It is well-established that compliance above 70% is associated with better outcomes compared to compliance below 70%. However, it remains debated whether outcomes further improve with increasing compliance among already compliant patients (>70%).

This audit aimed to analyze whether higher compliance levels correlate with progressively better outcomes.

Materials and Methods: The audit included 749 patients enrolled in our institution's colorectal ERAS* program from April 2018 to October 2024, all with ≥70% compliance.

Patients were divided into three groups: group 1, 2 and 3 for overall compliance between 70-79%, 80-89%, and ≥90%, respectively. Descriptive statistics was used to compare the groups.

Outcomes analyzed included hospital length of stay (LOS), complications, 30-day mortality, unplanned intensive care unit (ICU) admissions, and readmissions. Linear and logistic regressions of the outcome variables were later used to adjust for possible confounders.

Results and Discussion: Of the 749 patients, 23,4% were in group 1, 41,4% in group 2, and 35,3% in group 3. Groups were generally balanced, except for ASA performance status, severe heart disease prevalence, intraoperative blood loss (lower with higher compliance), and laparoscopic surgery rates (higher with higher compliance).

Outcomes improved along with higher compliance: in group 1, 2 and 3, median LOS decreased from 6 to 5 to 4 days (p=0,001); 30-day mortality dropped from 3,0% to 1,0% to 0% (p=0,014); complication rates decreased from 55,4% to 36,5% to 17,8% (p<0,001); and ICU admissions fell from 12,0% to 5,5% to 1,9% (p<0,001), respectively.

These differences were statistically significant and remained robust after adjusting for confounders. Hospital readmission rates remained similar across groups.

Conclusion(s): Increased compliance with the ERAS® program correlates with progressively better outcomes, including reduced LOS, complications, and mortality.

Full adherence to ERAS® protocols enhances outcomes even in already compliant patients, reinforcing the value of maximizing compliance.

11AP05-12

Effect of dexmedetomidine versus subanaesthetic ketamine infusions on postoperative cognitive function in patients undergoing major abdominal surgeries: a randomized controlled trial

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Background and Goal of Study: Cognitive dysfunction is a common neurological complication after major surgeries, affecting 25-40% of patients¹. First identified by Bedford in 1955², post-operative cognitive dysfunction (POCD) can present as memory loss, impaired concentration, or delirium, with an incidence of 25.8% after one week and 9.9% three months post-surgery³. Risk factors include advanced age, prolonged surgery, pre-existing cognitive impairment, and certain medications^{3,4}.

The Mini-Mental State Examination (MMSE) is often used to assess cognitive function.

The study aims to compare the effects of dexmedetomidine and ketamine, both known for their neuroprotective properties, on POCD and MMSE scores, after major abdominal surgeries.

Materials and Methods: The study was a prospective, randomized trial conducted at AIIMS Bhubaneswar from Sept 2020 to May 2022. Patients aged 18-80 years, undergoing elective major abdominal surgeries with ASA 1 or 2, were randomised into three groups:

Group A received dexmedetomidine infusion (0.5 mcg/kg/hr), Group B received ketamine infusion (0.1 mg/kg/hr), and:

Group C received placebo (normal saline at 6 ml/hr).

Standardized anesthesia and postoperative analgesia protocols were followed, and the MMSE score was assessed preoperatively and 6 hours post-extubation.

Results and Discussion: Postoperative MMSE scores were significantly higher in the Dex group (26.88±1.9) compared to the ketamine (24.88±1.68) and placebo groups (25.76±2.04) (p=0.02). The time to extubation and recovery room Modified Aldrete scores were significantly better in the Dex group. Additionally, intraoperative hemodynamics were lower in the Dex group.

Conclusion(s): Dexmedetomidine significantly preserves cognitive function better than subanesthetic ketamine and placebo after elective major abdominal surgeries. It reduces the incidence of cognitive dysfunction, particularly in abdominal surgeries.

References:

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- 2. BEDFORD PD. Adverse cerebral effects of anaesthesia on old people. Lancet. 1955 Aug 6;269(6884):259-63. doi: 10.1016/s0140-6736(55)92689-1.
- 3. Stephen, Gold., Samuel, Forryan. Postoperative cognitive decline: A current problem with a difficult future. Trends in Anaesthesia and Critical Care, (2019).;24:49-58.

11AP06-1

Extremely low BIS levels during robotic radical prostatectomy: an intraoperative case report

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Background: Monitoring anesthesia depth is critical for patient safety during surgery. The Bispectral Index (BIS) is commonly used to assess the hypnotic effects of anesthetics on the brain. Maintaining BIS values between 40 and 60 is essential to prevent awareness and reduce long-term neurological damage.

Case report: A 68-year-old male with hypertension and diabetes underwent robotic prostatectomy for prostate cancer. He received general anesthesia with Target-Controlled Infusion (TCI) of Propofol (20mg/mL) using the Schnider model, maintaining BIS values between 40 and 60.

The patient was intubated and blood pressure was monitored non-invasively. He was placed in a 17° Trendelenburg position for the surgery. After 3.5 hours, as the resection neared completion, the BIS dropped to 18, prompting a reduction in the Propofol dose. BIS continued to decline and TCI infusion was stopped.

Despite 25 minutes without anesthetic, the BIS remained between 1 and 17, with very low density of waves in the Density Spectral Array (DSA), almost flat electroencephalography (EEG) activity and suppression rates of 80-100%. The sensors and signals were checked and no dysfunction was found.

Prior Mean Arterial Pressure (MAP) was 83 mmHg and the heart 85 bpm, both varying less than 20% during this period. Ventilation was unaffected as Rocuronium perfusion was maintained. Arterial CO2 was 55 mmHg.

Cerebral oximetry sensors were placed and showed no significant asymmetry (80% right, 84% left), despite the reference value for this patient not being known. Cerebral edema was suspected and Mannitol 2g was administered intraoperatively.

Propofol infusion was resumed at lower doses as the BIS began to slowly rise. Anesthetic emergence was unexpectedly rapid and the patient was immediately oriented in time and place.

No neurological deficits or signs of awareness were found upon awakening, in the Post-anesthesia Care Unit (PACU) or in the infirmary.

Discussion: Trendelenburg position, pneumoperitoneum and hypercapnia can increase intracranial pressure (ICP), which may lead to cerebral edema, potentially reducing EEG amplitude below the BIS detection threshold.

This case underscores the importance of early identification and management of cerebral edema to prevent complications, from mild cognitive impairment to death.

Learning points:

- Trendelenburg, pneumoperitoneum, and hypercapnia can increase ICP.
- · Cerebral edema should be promptly addressed to avoid postoperative complications.

11AP06-2

Patient centred outcomes and resource utilisation (PACORUS-D) - Validation of "Days alive and out of hospital" in noncardiac surgery a prospective multicenter cohort study

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Background and Goal of Study: In the perioperative setting, "days alive and out of hospital" (DAOH) has been proposed as patient-centred outcome [1].

Nevertheless, this recently endorsed endpoint still suffers from limited validation across health care systems. Our aims were:

- 1. Quantifying DAOH after noncardiac surgery in Germany;
- 2. Assessing the impact of preoperative risk factors and postoperative complications on DAOH;
- 3. Evaluating the criterion (predictive) validity of DAOH for patient-reported disability at 365 days.

Materials and Methods: prospective multicenter cohort study (PACORUS-D; NCT: NCT04675905; Main endpoints: DAOH at 30 and 365 days; secondary endpoints: disability after 1 year (WHO-DAS 2.0 score), 1-year mortality; main exposures:

- 1. Preoperative risk (ACS NSQIP);
- 2. Postoperative complications (Clavien-Dindo class);
- 3. DAOH; We conducted descriptive analysis, multivariate quantile and logistic regression analysis.

Results and Discussion: Out of 1474 patients, 1030 with complete case and follow up after 1 year were analyzed (67% male, age: 67 [60-74] years). Median DAOH was 24 [Interquartile range (IQR): 18-27] after 30 days and 357 [IQR: 341-361] after 365 days. 1-year mortality was 6.4% and "new onset clinically significant disability" at 365 days was 12.6%. Quantile regression analysis showed significant independent association of preoperative risk and postoperative complications with DAOH (s. Figure 1).

Odds ratio (OR) for the association of 30 days DAOH with new onset 1 year disability was 0.94 [95%CI: (0.92-0.96)].

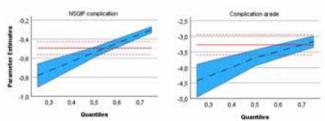


Figure 1.

Conclusion(s): This cohort confirms the construct validity of DAOH in the German health care systems and the predictive ability of DOAH at 30 days for new 1-year disability, i.e. the predictive ability of the patient-centred outcome DAOH for the patient-reported outcome disability.

References:

1. Myles, P.S., et al., Validation of days at home as an outcome measure after surgery: a prospective cohort study in Australia. BMJ Open, 2017. 7(8): p. e015828.

11AP06-3

Acute myocardial damage in a young patient with no risk factors after epidural catheter insertion

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Background: Myocardial injury after non-cardiac surgery (MINS) is defined as myocardial injury due to ischemia occurring during or within 30 days after a non-cardiac surgery. Risk factors include: age ≥65 years, coronary or peripheral arterial disease, diabetes, renal insufficiency, elevated pro-BNP, ST-segment changes.

Case Report: 40-year-old female scheduled for laparotomic hysterectomy. Medical history: smoking, epilepsy, and depression. In the operating room she was in good general condition.

Decision was made to place an epidural catheter with easy single puncture, no cerebrospinal fluid or blood return upon aspiration, and negative test doses.

Prior to induction, she experienced hypotension and bradycardia, episodes of agitation and decreased consciousness level while maintaining spontaneous ventilation. Electrocardiogram (previously normal) showed ST-segment depression in the inferior leads and precordial leads.

Surgery was suspended, and the patient transferred to the ICU where echocardiography showed no segmental alterations. The patient improved favorably. Serial troponin tests peaked at 1270 ng/mL with normalization of the ECG. Coronary angiography found no significant coronary lesions.

Discussion: MINS is a rare but potentially fatal complication in patients without risk factors, has prognostic implications, and should be recognized for its possible occurrence and management.

The special scope of our case and our aim to emphasize the possibility of occurrence in unsuspecting patients; also to delve into the broader definition of myocardial damage in perioperative period and not just the purist diagnosis of infarction, as we are not accounting for a high number of patients.

Learning points: Diagnosis based on two criteria:

- Non-cardiac surgery within the last 30 days with an elevated troponin level
- · Exclusion of non-ischemic causes of troponin elevation

The diagnosis of MINS is broader than that of perioperative myocardial infarction; it includes not only myocardial infarction but also other causes of perioperative myocardial injury of prognostic importance due to ischemia.

MINS incidence is estimated around 8% (though studies with patients <45 years without associated risk factors are still inconclusive). It is more frequent within the first 48 hours post-surgery and increases the risk of non-fatal cardiac arrest, heart failure, and stroke compared to patients without MINS. Troponin elevation is an independent predictor of 30-day mortality.

11AP06-4

Patient centred outcomes and resource utilisation (PACORUS-D) – Disability after noncardiac surgery: a prospective multicenter cohort study

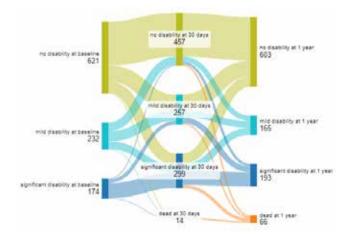
A. Stroda¹, C. Bußhoff¹, M. Rallis¹, O. Aydemir¹, T. Schüssler¹, G. Lurati Buse¹, PACORUS-D investigators ¹University Hopital Duesseldorf, Department of Anaesthesiology, Duesseldorf, Germany

Background and Goal of Study: Recently, the 12-items WHODAS 2.0 has been proposed as preferred tool for the measurement of impaired functional status (disability) after surgery [1]. Nevertheless, epidemiology of disability in unselected patients after non-cardiac surgery is underexplored. Thus, we aim at:

- 1. Quantifying disability after noncardiac surgery
- 2. Describing the flow of disability from preoperative status to 365 days after surgery;
- 3. Assessing the impact of preoperative risk factors and postoperative complications on postoperative disability.

Materials and Methods: prospective multicenter cohort study (PACORUS-D; NCT: NCT04675905); Main endpoint: "new onset clinically significant disability" at 30 and 365 days (WHODAS 2.0 ≥ 35% with increase of at least 5% compared to baseline; Main exposures: 1) preoperative risk (ACS NSQIP); 2) postoperative complications (Clavien-Dindo class). We conducted descriptive analysis including Sankey diagram and multivariate logistic regression analysis.

Results and Discussion: Of 1474 patients, 1030 with complete follow up at 1 year were analyzed (67% male, median age: 67 [Interquartile range (IQR): 60-74] years). At 30 and 365 days, respectively, 21.5% and 12.6% reported a new significant disability. Figure 1 shows the flow of disability from preoperative status to 365 days after noncardiac surgery. The Odds ratio (OR) for the independent association of preoperative risk with disability after 30 and 365 days was 1.06 [95% CI: (0.96-1.17)] and 1.08 [95% CI: (0.97-1.20)], respectively. The OR for the independent association of postoperative complications with disability after 30 and 365 days was 1.46 [95%CI: (1.28-1.65)] and 1.40 [95%CI: (1.23-1.59)].



Conclusion(s): This prospective multicenter cohort indicated that while at 30 days disability was increased, by one year, disability returned to levels comparable to baseline. In contrast to postoperative complications, the preoperative risk has no impact on new postoperative disability.

Reference:

1. TB, Ü., et al., Measuring Health and Disability: Manual for WHO Disability Assessment Schedule (WHODAS 2.0) 2010, World Health Organization 2010: Geneva

11AP06-5

Nitrous oxide added at the end of sevoflurane anesthesia hastens early recovery - SEVONATE trial

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Background and Goal of Study: ISONATE trial showed when N₂O was administered at the end of isoflurane anesthesia it significantly shortened emergence without increasing the incidence of PONV.1

We investigated effects of N₂O at the end of sevoflurane anesthesia on recovery.

Materials and Methods: Patients aged 18-80 years, ASA PS I - III, undergoing elective laparotomy/laparoscopic surgery with duration of >120 min were randomized into 2 groups according to carrier gasses: GO₂ - air/30% O₂ and GN₂O - same mixture until last 30 minutes of surgery when 70% N₂O/30% O₂ was used. Anesthesia was standardized and maintained with sevoflurane ~1 MAC.

Time to extubation, eye opening, following commands, answering simple questions and orientation were recorded. Simple verbal orders were repeated every 15 seconds.

Results and Discussion: 51 patients in GN₂O and 50 in GO₂ completed the study. There were no differences in characteristics between the two groups. Mean time of N₂O administration in GN₂O was 24.8±9.4 min.

Mean time to extubation was faster in the GN₂O (5.5±2.6 min) than in the GO_a (9.1±4.0 min), mean difference 3.6 min; 95% CI 2.3 to 4.9, P<0.001, also ability to open eyes, follow commands, and being oriented (mean differences 3.6, 3.4 and 3.7 minutes, respectively, P<0.001 in all). (Table 1.)

	GN ₂ O (air/ N ₂ O) n=51	GO ₂ (air) n=50	Р
Open eyes (sec)	258 ±154	476 ±238	<0.001*
Follow commands (sec)	316±167	521 ±234	<0.001*
Tracheal extubation (sec)	330 ±159	543±242	<0.001*
Answering to simple questions (sec)	525±146	632±278	0.042*
Orientation (sec)	520±220	739±318	<0.001*
Complications on emergence (n, %)	9 (18)	11 (22)	0.625

Data presented as mean ±SD, n (%) *P<0.05

Table 1. Early recovery.

There were no differences between the groups in postoperative pain, in early and late postoperative recovery. GN2O group received significantly less pain medications; tramadol (medians 0 vs 100 mg, P=0.037), paracetamol (33% vs 62%, P=0.004) and ketoprofen (16% vs 32%, P=0.054), respectively. GN₂O had higher PONV risk scores and increased incidence of early PONV. The quality of late recovery was not influenced by adding N₂O.

Conclusion: This study showed that adding 70% N₂O in the last 30 minutes of general anesthesia maintained with sevoflurane hastened extubation and early recovery. Moreover, it reduced the overall use of postoperative pain medications.

Reference:

1. Mraovic B, Simurina T, Gan TJ. Can J Anaesthesia 2018; 65(2): 162-9

11AP06-6

Pancreaticoduodenectomy for insulinoma in a patient with untreated severe aortic stenosis: a case report

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Background: Insulinoma is a rare insulin-producing tumor of the pancreas. Definitive treatment requires surgical resection and the anaesthetic approach has important particularities. Furthermore, managing major comorbidities, such as severe aortic stenosis, can pose significant challenges for anaesthetic planning.2

Case Report: A 73-year-old woman with severe hypoglycaemia was diagnosed with insulinoma and offered pancreaticoduodenectomy.

She had a history of atrial fibrillation and severe aortic stenosis. The echocardiogram showed the aortic valve with a mean pressure gradient of 47mmHg, a functional valve area of 0.8-0.9cm² and a systolic ventricular ejection fraction of 60%.

Preoperatively, a continuous infusion of 10% glucose at 40ml/h was started after the beginning of the fasting period, which was maintained intraoperatively until tumour resection. The surgery was performed under balanced general anaesthesia with glycaemic monitoring via Freestyle libre 2® every 15 minutes and hourly blood gas test. Diazoxide 25mg and verapamil 80mg were administered prior to surgery and octeotride 0.2mg intraoperatively. Due to severe aortic stenosis, strict haemodynamic control was carried out using invasive arterial pressures and continuous noradrenaline perfusion. Particular attention was also paid to controlling heart rate and intravascular volume. Due to the risk of arrhythmia, multifunction paddles were applied to the patient and a defibrillator was placed in the operating room.

The procedure and post-operative period were uneventful. Patient was discharged after 7 days.

Discussion: Insulinoma can lead to life-threatening situations due to hypoglycaemia.1 Severe aortic stenosis is associated with an increased risk of peri-operative morbimortality, with valve repair recommended prior to high-risk surgery, such as pancreaticoduodenectomy.2 In asymptomatic patients with severe aortic stenosis and preserved systolic ejection fraction, high-risk surgery may be reasonable with strict haemodynamic monitoring in place.2

References:

1. Goswami J, et al. Insulinoma and anaesthetic implications. Indian J Anaesth. 2012;56(2):117-22

2-Rohatgi N, et al. Perioperative Considerations for Patients with Severe Aortic Stenosis Undergoing Elective Noncardiac Surgery. Am J Med. 2023;136(10):960-962

Learning points: The approach to patients with severe aortic stenosis proposed for high-risk surgery should be individualised, considering the risk/benefit of postponing the procedure.

11AP06-7 When the cause isn't obvious: a cardiac arrest event in the operating room

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Background: Cardiac arrest (CA) in the operating room (OR) is a rare event with more than 50% mortality. When it happens it's important that all healthcare professionals know how to manage the case and correct reversible causes, even the ones that don't come immediately to our mind.

Case Report: We present the case of a 64-year-old dependent woman with type 1 chronic respiratory insufficiency after bilateral pulmonary embolism, epilepsy, cognitive impairment and left hemiparesis sequelae to meningitis. She was submitted to urgent laparotomy due to intestinal ischemia.

She was in septic shock (blood pressure (BP) 77/42 mmHg) with multiorgan dysfunction. Before induction we initiated invasive monitoring of the BP and started fluid therapy as well as a noradrenaline (NA) infusion.

Then we performed an uneventful rapid sequence intubation with ketamine and rocuronium. A few minutes later, CA occurred (pulseless electrical activity vs ventricular fibrillation).

Advanced life support was initiated with the administration of adrenaline 1mg and there was return of spontaneous circulation (ROSC) after 2 minutes. Two more episodes of pulseless ventricular tachycardia followed with ROSC after defibrillation.

After the stabilization, the surgery began and was successful. Hemodynamic stability was maintained with NA and terlipressin. The patient was then transferred to the intensive care unit (ICU).

Discussion: Further investigation in the ICU showed T wave inversion in DI, DII and aVF and increased Troponin/NT-proBNP. Transthoracic echocardiogram revealed hypokinesia of the anterolateral wall (ejection fraction 20%).

These findings suggested a type I myocardial infarction. However, cardiac magnetic resonance showed normal systolic function without evidence of structural heart disease and hemodynamic compromise.

Reference:

Shahreyar M, Fahhoum R, Akinseye O, Bhandari S, Dang G, Khouzam RN. Severe sepsis and cardiac arrhythmias. Ann Transl Med. 2018 Jan;6(1):6

Learning points: Despite being a rare event, this patient had several predictors: age, elevated ASA classification, septic shock and urgent surgery. It's important to follow the advanced life support algorithm like in any other situation and focus on the reversible causes, even if in some cases, the differential diagnosis isn't possible. Moreover, CA due to sepsis typically occurs in a non-shockable rhythm. This case represents an exception.

11AP06-8

Takotsubo cardiomyopathy during a total hip arthroplasty

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Background: Takotsubo cardiomyopathy (TCM) is a rare cardiac complication in the perioperative setting and mortality can be as high as 20% in the 10-year follow-up¹.

Only a few cases have been reported in orthopaedic and surgical literature

Case Report: We present a clinical case of TCM in a 73-yearold woman during an elective total hip arthroplasty. After a total blood loss of 1,5 liters, the patient developed acute chest pain, electrocardiography showed ST segment elevation and laboratory workup revealed an elevation of myocardial biomarkers. Ecocardiography revealed a left ventricular ejection fraction (LVEF) of 35%, apical hypokinesis and compensatory hypercontractile base

The coronary angiogram showed absence of obstructive coronary disease. Resuscitation was achieved with cristalloids and packed red blood cells and vasopressor support was initiated. The patient was discharged on day 7 with normalization of LVEF.

Discussion: TCM is characterized by transient left ventricular dysfunction without evidence of obstructive coronary artery disease. Much evidence suggests that it is precipitated by an excess of circulating catecholamines, leading to microvascular spasm and myocyte injury. Its characteristics are not easily identified in the perioperative environment due to the hemodynamic changes related to surgery and anaesthesia².

Initial management focuses on supportive care and prevention of complications. As far as we know, there are only two case reports of TCM during orthopaedic surgery and injection of pressurized cement was identified as the trigger³.

In our case the triggers were blood loss and psychological stress. The patient was treated initially as a type 2 acute coronary syndrome but key echocardiographic features helped determine the exact aetiology.

References:

- 1. Ravindran J, Brieger D. Clinical perspectives: Takotsubo cardiomyopathy. Internal Medicine Journal 2024;54:1785–1795 2. Agarwal S, et al. Perioperative Takotsubo Cardiomyopathy: Implications for Anesthesiologist. Annals of Cardiac Anaesthesia. 2019; 22:309-315
- 3. Busse E, Wiater J. Perioperative Takotsubo Cardiomyopathy: A Rare Cardiac Complication Following Orthopaedic Surgery: A Case Report. 2015;5:e64

Learning points: TCM diagnosis and management remains challenging in the perioperative setting. Clinical findings, electrocardiography and imaging are key to an accurate diagnosis.

Further research is needed regarding TCM pathophysiology and effective treatment.

11AP06-9

General anesthesia in a patient with corticobasal syndrome: a rare clinical case

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Background: Corticobasal syndrome (CBS) is a rare neurodegenerative illness characterized by dystonia, cognitive decline, and an asymmetric akinetic-rigid syndrome. Anesthetic management of CBS is challenging due to altered pharmacodynamics, autonomic dysfunction, and potential neuromuscular hypersensitivity.

Literature on perioperative care in CBS is scarce, highlighting the importance of case reports to guide practice.

Case Report: A 74yo woman with CBS, chronic obstructive pulmonary disease, chronic kidney disease, and cervical radiculopathy presented with severe dysphonia attributed to a chord lesion and progression of CBS and was scheduled for laryngeal microsurgery. Balanced general anesthesia was induced with propofol and rocuronium with adequate muscle relaxation. Neuromuscular blockade was reversed with sugammadex, allowing smooth extubation without complications.

The patient was closely monitored overnight due to her neurodegenerative and comorbid conditions and was discharged the next day. A month later the patient remained without neurological complications.

Discussion: Reporting the anaesthetic management of patients with CBS is scarce. Challenges include sensitivity to anesthetic drugs, potential autonomic instability, altered responses to neuromuscular relaxants and postoperative complications such as dysautonomia and respiratory depression.

Neuromuscular blockade reversal with sugammadex was effective and avoided the complications associated with anticholinesterase agents.

A tailored approach to CBS, including careful perioperative monitoring and judicious selection of anesthetic agents, is critical to mitigate these risks.

This case adds to the limited body of knowledge demonstrating the feasibility of general anesthesia in such patients.

References:

Van den Berg ME et al. Anesthesiology Clinics 2019;37(4):651-664. Schaltenbrand G. Journal of Neurology 2018;265(2):563-575. Ball N et al. British Journal of Anaesthesia 2020;125(1):e150-e153.

Learning points:

- · CBS requires individualized anesthetic strategies due to its rarity and complex symptomatology.
- · Neuromuscular blockers can be used effectively with appropriate reversal agents such as sugammadex.
- · Reporting such cases enriches the evidence base, aiding clinicians in managing perioperative risks in rare neurodegenerative conditions.

11AP06-11

Colombia

Intraoperative management of a patient with complex multi-valve disease and atrial fibrillation undergoing non-cardiac surgery. Back to basics: approaches when unable to measure cardiac output

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Background: Patients with mitral or aortic regurgitation have a higher mortality rate in the postoperative period (1).

Case Report: A 46-year-old female patient in whom multi-valvular disease secondary to aortic and mitral valve endocarditis was documented resulting in moderate aortic stenosis and severe regurgitation, severe mitral regurgitation and severe tricuspid regurgitation.

Additionally, she had valvular paroxysmal atrial fibrillation and severe pulmonary hypertension. Subsequently, a pseudoaneurysm of the left common iliac artery was found and then scheduled for a femoral artery bypass.

Invasive arterial pressure plus standard ASA monitoring was decided. Induction was conducted with fentanyl, propofol and cisatracurium with maintenance using remifentanil and sevoflurane. Hemodynamic support was provided with norepinephrine and milrinone.

Postoperative arterial blood gases showed acid-base balance and lactate of 1. The patient was transferred to the ICU with hemodynamic support and spontaneous ventilation.

Postoperative clinical course was uneventful and mitral and aortic valve replacement with tricuspid valvuloplasty was performed three days later. She was discharged home ten days after the procedure.

Discussion: This is a particular case as the patient presented with triple valvular lesions and atrial fibrillation, which posed a challenge for intraoperative monitoring. Atrial fibrillation impeded the proper pulse contour analysis and severe tricuspid regurgitation is considered a relative contraindication for a Swan-Ganz catheter.

Therefore, hemodynamic monitoring was guided by arteriovenous blood gas analysis and understanding of hemodynamic goals for valvular pathologies.

The case was successfully managed, allowing for subsequent surgical intervention of her valvular pathology and posterior discharge home. Hemodynamic monitoring through estimates based on arteriovenous blood gas analysis is an alternative when invasive cardiac output monitoring is not possible due to patient characteristics or availability of such technologies

Reference:

Richter, E. W., et. al (2022). Mitral regurgitation in patients undergoing noncardiac surgery. Seminars in Cardiothoracic and Vascular Anesthesia, 26(1), 54-67.

Learning points: Understanding the physiology of valvular pathologies and their intraoperative management goals for noncardiac surgery is essential, especially when invasive or minimally invasive methods of cardiac output monitoring cannot be used.

11AP06-12

Modified jet ventilation using high oxygen flow and a Mapleson D circuit for transtracheal tumor resection

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Background: Tracheal tumors are rare, with nonspecific clinical presentations and progressive airway obstruction, typically requiring surgical resection. This involves a shared airway between the anesthesiologist and the surgical team, making ventilation in this context a true anesthetic challenge.

Case Report: A 19-year-old was referred to our hospital for a positron emission tomography (PET) scan due to suspected tracheal tumor. During the procedure, the patient developed hypoxemia and desaturation that did not improve with supplemental oxygen necessitating transfer to the Emergency Department for anesthesiology evaluation. A rapid sequence intubation was performed. A decision was made to resect the tumor via an endotracheal approach using rigid and flexible bronchoscopy.

Total intravenous anesthesia (TIVA) was administered. For ventilation during rigid bronchoscopy, a Bain circuit was used with an oxygen flow rate of 70 liters per minute, connected to an auxiliary oxygen supply.

Discussion: During the perioperative period, rigid bronchoscopy provided the surgical exposure required for resection. Based on the literature, options for patient ventilation include apneic oxygenation, jet ventilation, high-frequency ventilation, assisted spontaneous ventilation, or controlled ventilation with a closed circuit [1].

The last two options were not feasible because a thoracoscopic approach had been considered and this required the patient to be under general anesthesia, and the transtracheal instrumentation prevented closure of the circuit [1,2].

Simulating the concept of jet ventilation, it was decided to maintain a high flow of 100% inspired oxygen to allow for oxygen diffusion through an open circuit due to the working channel of the rigid bronchoscope [2].

References:

- 1. Pathak V, Welsby I, Mahmood K, Wahidi M, MacIntyre N, Shofer S. Ventilation and anesthetic approaches for rigid bronchoscopy. Ann Am Thorac Soc. 2014;11(4):628–34.
- 2. Galway U, Zura A, Khanna S, Wang M, Turan A, Ruetzler K. Anesthetic considerations for bronchoscopic procedures: A narrative review based on the Cleveland clinic experience. Vol. 11, Journal of Thoracic Disease. 2019.

Learning points: Sharing the surgical field and the ventilatory system requires a combined understanding of surgical technique, ventilation options, and timely identification of associated complications.

11AP07-1

Hemodynamic management in abdominal paraganglanglioma surgery

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Background: Paragangliomas are rare neuroendocrine tumors (0.2-1/100,000) arising from chromaffin cells outside the adrenal gland (extra-adrenal). Most sympathetic ganglion-derived tumors are located in the abdomen and produce excess catecholamines; extraadrenal tumors produce noradrenaline.

The risk of these patients is high with intraoperative complications such as: hypertension, tachycardia, arrhythmias, cardiovascular collapse and hypotension after tumor resection.

Case Report: Our management was divided into three phases: induction, tumor manipulation and extraction. We premedicated with midazolam and fentanyl, placed thoracic epidural catheter and cannulated radial artery for invasive monitoring. Induction with lidocaine, fentanyl, Propofol and rocuronium and intubation with McGrath video laryngoscope for less stimulation, without hemodynamic alterations.

Maintenance with sevoflurane and remifentanil. During tumor manipulation, blood pressure and sinus tachycardia increased to 130lpm with the need for continuous perfusion of clevidipine, esmolol and magnesium sulfate.

After tumor resection, hemodynamic instability with the need for phenylephrine, continuous perfusion of noradrenaline and vaso-pressin.

According to the latest guidelines, it is recommended to use target-guided hemodynamic monitoring devices, we use acumen IQ (Edward) with hypotension prediction index (HPI). After completion of surgery, extubation and transfer to hemodynamically unstable resuscitation. During the following 48 hours in resuscitation, vasopressors were decreased without incident.

Discussion: As anesthesiologists we must be aware of the high risk of this surgery with its possible complications such as arrhythmias, hypertension, subsequent hypotension and cardio-vascular collapse, as well as their treatment. We must use drugs with rapid onset and duration due to the variable hemodynamic alterations.

The use of hemodynamic monitoring is very useful in the management of these surgeries. It is essential to choose anesthetic drugs with little sympathetic and histamine-releasing stimulation.

References:

Schäpfer P, Albrecht E, Baumgartner M, Blanc C. Anesthetic management in adrenal gland surgery. EMC- Anesthesia-Resuscitation 2017; 43(2):1-8 [Article E-36-590-A-170].

Learning points: The management of this pathology must be properly understood.

11AP07-2

Role of rare anatomical variation in adapting anaesthesia management in Kartagener's syndrome

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Background: Kartagener's syndrome (KGS) is a rare autosomal recessive disorder characterized by a triad of situs inversus, bronchiectasis and chronic sinusitis resulting from defective cili-

Dextrocardia with complete situs inversus occurs in approximately 2 per 10 000 births.2

Anaesthetic management in KGS focuses primarily on preventing respiratory and cardiac complications, which pose significant perioperative challenges.

Case Report: A 45-year-old female patient, ASA II, was scheduled for tympanoplasty combined with tympanomastoidectomy due to bilateral conductive hearing loss.

Patient's medical history included KGS with situs inversus totalis, asthma, hypothyroidism, grade I obesity, and non-insulin-dependent type 2 diabetes mellitus.

Pulmonary function tests revealed a mixed ventilatory defect with a moderate obstructive component, and an ECG with reversed leads was normal. Standard ASA monitoring was applied, including ECG with reversed leads, neuromuscular blockade monitoring, processed EEG.

Total intravenous anaesthesia (TIVA) with propofol and remifentanil target-controlled infusion was used. After the administration of 60 mg of rocuronium, an attempt at endotracheal intubation was performed using direct larvngoscopy, which revealed a Grade II laryngoscopy (Cormack-Lehane classification) and difficulty in guiding the RAE tube.

After optimization, a second attempt using videolaryngoscopy was successful. The surgery was uneventful, and hemodynamic stability was maintained throughout. Neuromuscular blockade was reversed with sugammadex (2 mg/kg).

After gentle orotracheal suctioning and recovery of spontaneous ventilation, extubation was performed. The postoperative period was uneventful, and the patient was discharged on postoperative day 1.

Discussion: Anaesthetic management in KGS requires strategies to minimize respiratory and cardiac risks. TIVA with propofol and remifentanil may help preserve mucociliary function, reducing pulmonary complications3, while reverse ECG electrode positioning addresses anatomical variations.

Learning points: Anatomical variations in KGS should be considered when monitoring for anaesthesia. Volatile anesthetics may exacerbate ciliary dyskinesia in KGS and predispose patients to respiratory complications; thus TIVA is a safe option in this population.

References:

1. DOI: 10.1016/j.prrv.2011.01.006 2. DOI: 10.1093/bja/85.6.919 3. Anesth Pain Med. 2012;7:317-319

11AP07-3

General anesthesia in a patient with spinal muscular atrophy type III (Kugelberg-Welander disease) with awake fiberoptic intubation: a case report

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Background: Spinal Muscular Atrophy (SMA) type III is a rare autosomal recessive disease characterized by progressive muscle weakness. Perioperative risks may be significant and often related to the respiratory system, namely respiratory failure and difficult intubation.

Neuromuscular blocking agents (NMBA) must be used carefully as the use of succinvlcholine may result in rhabdomyolysis and hyperkalemia and the duration non-depolarizing NMBA's block may be prolonged1.

Case Report: A 62-year-old woman, with SMA type III presented for right breast lumpectomy with sentinel lymph node biopsy because of a stage II invasive carcinoma. She was wheelchairbound, under nocturnal non-invasive ventilation and had dysphagia in relation with disease progression. She also had a multinodular goiter that extended into the mediastinum, with a neck and chest CT scan showing a retrosternal thyroid causing moderate tracheal deviation. The patient had several difficult airway predic-

We performed an awake fiberoptic intubation, with first attempt success. Total intravenous anesthesia with no NMBA was used. A serratus anterior plane block with ropivacaine was performed after induction. The patient was extubated in the operating room and transferred to a surgical intermediate care unit. She was discharged from the hospital 2 days after surgery.

Discussion: Patients with SMA have an increased risk of complications following general anesthesia. There is supporting evidence regarding safe use of non-depolarizing NMBA, however for patients with respiratory impairment the decision not to use NMBA should be considered to prevent postoperative respiratory depression, associated with residual block.

This case also presented the additional challenge of the difficult airway, preventing the use of other NMBA sparing options, such as the use of a supraglottic device.

A careful pre-anesthetic evaluation and planning should be carried and an individualized plan made for each patient considering the stage of the disease.

Reference:

1. Islander G, et all. Anesthesia recommendations for patients suffering from Spinal muscular atrophy. Orphan Anesthesia,

Learning points: Anesthesia plan for patients with SMA must be individualized, considering disease progression, respiratory impairment and difficult airway.

The decision not to use NMBA should be considered when pos-

Awake fiberoptic intubation is a valid option if a difficult airway is present, which also spares the use of NMBA.

11AP07-5

Functional characteristics of malignant hyperthermia variant R174W in the alpha 1 subunit of the dihydropyridine gene (CACNA1S)

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Background: Malignant hyperthermia (MH) is an autosomal dominant pharmacogenetic disorder of skeletal muscle calcium (Ca²⁺) homeostasis. MH causative variants have been identified in genes coding for ryanodine receptor (*RYR1*), alpha 1 subunit of the dihydropyridine (*CACNA1S*) and *STAC3*. Most of these pathogenic variants were in *RYR1* and only two in *CACNA1S* (https://www.emhq.org/diagnostic-mutations).

This study aimed to examine the Ca²⁺ kinetics on cultured human myotubes in a pathogenic *CACNA1S* variant R174W and infer the mechanism for MH pathogenesis.

Materials and Methods: We selected 21 patients who underwent MH predisposition test (Ca-induced Ca release [CICR] test) and classified into three groups; R174W: 1 patient (cell count n = 6-15), RYR1 group (variants in *RYR1* identified as the cause of MH): 10 subjects, and N group (normal CICR rate: no pathogenic variants in *RYR1* and *CACNA1S*): 10 patients.

The intracellular Ca²⁺ concentration [Ca²⁺]*i*. of the myotube was determined using fluorescent Ca²⁺ imaging system with fura-2. The 50% effective concentrations (EC₅₀) for caffeine and 4-chloro-m-cresol (4-CmC) were calculated from the dose-response curves

The resting [Ca²+]i and the decreased [Ca²+]i. after 50µM dant-rolene (Dan) loading were examined. The values were expressed as median [interquartile range]. The Kruskal-Wallis test and Dunn's multiple comparisons test were used.

Results and Discussion: The EC $_{50}$ values for caffeine and 4-CmC were 4.50 [4.03–5.86] mM, 226.8 [167.8–285.7] μ M in R174W group, 2.54 [1.92–2.75] mM, 127.4 [84.5–147.9] μ M in RYR1 group, 4.93[4.32–5.85] mM, 278.8 [225.2–302.7] μ M in N group, respectively. EC $_{50}$ was not significantly different between R174W group and N group. The resting [Ca $^{2+}$]i were 93.1 [81.0–109.1] nM in R174W group and 105.4 [103.8–112.1] nM in RYR1 group, significantly higher than 71.2 [65.4–72.7] nM in N group.

The decreased [Ca²⁺]i. after Dan loading were 23.4[17.5–26.6] nM in R174W group and 30.9 [25.7–47.2] nM in RYR1 group, which were significantly higher than in N group (13.3 [11.3–19.6] nM).

Conclusion(s): The development of MH in the patient with R174W variant involves increased [Ca²⁺]i. in skeletal muscle cells by mechanisms other than increased RYR1 sensitivity. We suggested that Dan may be effective in R174W variant.

11AP07-7

Simple techniques, complex outcomes – Sudden cardiorespiratory arrest during jugular central venous catheter placement in a patient with epilepsy: a case report

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Background: Patients with certain pre-existing conditions can complicate otherwise routine procedures. Sudden unexpected death in epilepsy (SUDEP), commonly associated with seizures, is the leading cause of mortality in patients with chronic refractory epilepsy¹.

This case report highlights a sudden cardiorespiratory arrest (CPA) in an epileptic patient during jugular central venous catheter (CVC) placement.

Case Report: A 67-year-old female with a 20-day hospital stay for pyelonephritis, requiring intravenous antibiotics and loss of peripheral venous access, was referred to the anesthetic team for jugular CVC placement.

Her medical history included obesity, cognitive impairment following a hemorrhagic stroke, and chronic epilepsy. During standard ASA monitoring and Trendelenburg positioning, the patient experienced an unnoticed focal seizure with rapid eye movements and apnea. This led to desaturation and subsequent CPA with asystole.

Immediate advanced life support was initiated, including cardiorespiratory resuscitation, laryngeal mask ventilation, and administration of 1 mg of adrenaline via a 22-gauge peripheral line placed by the nursing team. Ventilation and spontaneous circulation were restored within two minutes, and the patient was transferred to the intensive care unit for further monitoring.

Discussion: This case underscores the importance of assessing patient-specific risks, procedural factors, and environmental conditions in anesthetic practice.

An otherwise routine CVC placement became a critical event due to an unexpected epileptic seizure compounded by Trendelenburg positioning and obesity, leading to hypoxia and CPA.

Reference:

Pathak SJ, et al. Sudden Unexpected Death in Epilepsy. [Updated 2022 Dec 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing

Learning points: Routine procedures can pose significant challenges, particularly in patients with complex medical histories. Vigilance and preparedness are essential to address potential complications.

11AP07-8

Influence of aging on clinical presentation of malignant hyperthermia

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Background: Malignant hyperthermia (MH) is common in young males. However, there have been no reports on the effect of aging on clinical manifestations in adults.

In this study, we analyzed the database of MH patients collected by our hospital to investigate the differences in clinical findings.

Methods: We compared the clinical characteristics of male patients aged 30-39 years (30s group) with those aged 65 years or older (elderly group) with a Clinical Grading Scale of 35 or higher (MH rank 5 or 6) since 1990.

The values are shown as medians (25-75%), and the χ -square test and Mann-Whitney test were used for statistical analysis. p<0.05 was considered significant.

Results: Thirty-three patients (19 in the 30s group and 14 in the elderly group) were included in the study. There were no significant differences in mortality rates, dantrolene use, or succinylcholine use between the two groups.

The first symptoms that led to the diagnosis of MH were increased EtCO2 (36.8%) in the 30s group and tachycardia of unknown origin (33.3%) in the elderly group.

The incidence of colored urine was higher in the 30s group than that in the elderly group (63.2% vs 11.1%, p=0.016). There were no significant differences in the incidence of muscle rigidity, dysphagia, tachycardia, or arrhythmia between the groups.

The maximum body temperature was 39.0 (38.6-40.1) $^{\circ}$ C in the 30s group and 39.7 (39.1-41.0) $^{\circ}$ C in the elderly group (p=0.17), but the time to maximum body temperature was 115 (80-150) minutes in the 30s group and 225 (165-263) minutes in the elderly group (p=0.017). There were no differences in PaCO2, pH, base excess, or serum potassium levels.

Conclusions: The early symptoms in MH, the incidence of colored urine, and the time to peak temperature were significantly different between the 30s group and the elderly group.

11AP07-10

Intraoperative ultrasound diagnosis by an anaesthesiologist, of an unexpected pregnancy in a surgical patient

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Background:We present a case of a 35-year-old woman, unaware of her pregnancy status, who was scheduled for elective open post-cesarean hernia repair.

Case Report: The patient's medical history included caesarean section 7 months ago, that led to postoperative hernia. She was still lactating and when she was asked about possibility of pregnancy her answer was negative (both to surgeons and anaesthesiologists). Induction of anaesthesia included fentanyl, propofol and rocuronium, sevoflurane for maintenance, and remifentanil in-

fusion. Upon finding a considerably enlarged uterus, the surgeons were concerned, so a blood $\beta\text{-hCG}$ test was performed. While awaiting the result, a trained, in ultrasound use anaesthesiologist, applied a curved ultrasound probe, to scan the enlarged uterus. Scanning clearly visualized a fluid-filled amniotic sac, along with the fetus, with a formed four-chamber beating heart, findings which were later confirmed by an obstetrician. Pregnancy was estimated to be 25 weeks, based on fetal head circumference measurement. The operation was discontinued, and post-extubation the patient was informed about the events (referral to an obstetrician for consultation).



Discussion: As menstrual irregularities are common among lactating mothers, the patient attributed amenorrhea to lactation and had no awareness for possible pregnancy. Intraoperative use of ultrasound by a trained anaesthesiologist, provided immediate, definitive diagnosis and appropriate decision making by the whole team

Learning points: There is need for continuous vigilance by anaesthesiologists for women in child baring age and possible pregnancy. This case report emphasizes the versatile role of ultrasound in the operating room, as an essential tool for anaesthesiologists in contexts beyond its conventional use.

11AP07-11

Attitudes of anaesthetists towards neuromuscular blockade monitoring: An audit in a teaching hospital

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Background and Goal of Study: International guidelines advocating for patient safety strongly recommend the use of quantitative neuromuscular blockade monitoring (NMBM) during general anaesthesia where neuromuscular blocking (NMBs) agents are used. An initial audit of practice in our hospital found that only in 24.6% of cases (n=122) were being monitored for adequate reversal of blockade prior to extubation. In view of this low compliance, departmental teaching was delivered to non-consultant hospital doctors (NCHD) with the goal of improving implementation of the

guideline. The result of this intervention was an increase in the percentage of monitored patients (53.8%, n=117). The objective of this project was to reach near 100% compliance in NMBM and improve patient safety by ensuring adequate reversal of NMBs.

Materials and Methods: A questionnaire was given to members of department with the goal of identifying the reasons behind the low compliance.

The questions referred to:

- 1. Frequency of NMB monitoring,
- 2. Preferred mode of monitoring,
- 3. Common reasons for refraining to use quantitative monitoring,
- 4. Reversal drug of choice, and;
- 5. Occurrence of complications.

An infographic was shared among NCHDS and also exhibited in every theatre summarizing the risks of residual blockade and how to use the NMBM device adequately. Teaching sessions were organized for both NCHDS and nursing staff to encourage the use of monitoring device.

Results and Discussion: Twenty anaesthetists initially replied to our questionnaire, reporting rare use of NMBM (1 in 10 cases or less) and listing "happy with clinical assessment" as the most common reason to forego monitoring.

After educational interventions, the practice of our department was re-audited and found no improvement in frequency of monitoring. (52.6% n=131). Despite multiple interventions in education, practitioners won't necessarily change their practice.

The anaesthetists' clinical experience together with the efficiency and affordability of sugammadex, has led to a heightened sense of safety, despite nine of the anaesthetists admitting that they had a complication due to inadequate reversal of muscle relaxants during their practice.

Conclusion(s): Educational interventions might not be sufficient to change clinical practices and further administrative interventions might be necessary.

11AP08-1 Emergency procedural sedation for broken glass ingestion: A case report in a NORA setting

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Background: Foreign body aspiration is a high-risk NORA (nonoperating room anaesthesia) procedure that often requires sedoanalgesia. We present a case of emergency esophagogastroduodenoscopy (EGD) due to broken glass ingestion.

Case Report: A 28-year-old male with no known history of chronic illnesses or regular medication use, but with a heavy smoking history, presented at 03:00 AM for procedural sedation during an emergency EGD following the ingestion of broken glass. The patient, with a normal chest CT and hemodynamic parameters within normal limits, had consumed no food or liquids except for glass, and the fasting period was appropriate.

After ASA-required monitoring, including end-tidal carbon dioxide, 1.5 mg/kg propofol (titrated) and 2 mg midazolam were administered for induciton. Propofol was continuously infused at 5–6 mg/kg/h, anticipating that the prolonged duration, to maintain moderate sedation. Intermittent suctioning was used for smoking-related secretions.

The procedure, lasting 90 minutes, involved the removal of nine glass fragments using an overtube. A submucosal stomach laceration was treated with a clip. Apart from that, esophageal laceration, gastric perforation, and any airway injury were not observed. Post-procedure, the patient was monitored in the PACU for 30 minutes and in the ward for one day, with an uneventful discharge.



Discussion: This case emphasizes the importance of following the ASA checklist for all NORA procedures. All pre-procedural evaluations were performed, and non-invasive end-tidal carbon dioxide monitoring was used to improve safety.

Though endotracheal intubation could have been considered, procedural sedation was deemed appropriate based on the patient's prior similar experiences.

In urgent, high-risk airway scenarios outside the operating room, a comprehensive anesthesia management strategy is crucial for ensuring patient safety.

Learning points A thorough preoperative evaluation, preparedness for potential difficult airways and complications, and the use of appropriate and sufficient monitoring techniques are essential for the successful management of NORA procedures.

Priapism and epidural anaesthesia - a case report of multimodal approach for pain management in a case refractory to surgery

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Background: Priapism, a persistent penile erection lasting four hours or more, occurs independently of sexual stimulation. It results from a dysfunction of the hemodynamic mechanisms regulating penile erection and detumescence. Priapism carries the risk of erectile dysfunction and mandates prompt evaluation and intervention!

We describe a complex case, refractory to three consecutive surgery interventions, requiring epidural analgesia.

Case Report: A 39-year-old male patient, known for smoking history and multiple drug addictions, presented with priapism for the past 36 hours elicited by a recreational injection of a prostaglandin-based compound.

Firstly, a penile shunt procedure was performed. Due to persistence of skeletal rigidity, an intracavernosal injection of adrenaline was administered. Despite these interventions, the skeletal rigidity remained unchanged;

Thirdly, a corporoglandular shunt was conducted under general anaesthesia, leading to a reduction in penile tumescence. After 1h, in the Post-Anaesthesia Care Unit (PACU), the priapism relapsed along with intense pain, despite fentanyl, morphine and ketamine administration.

Epidural analgesia with ropivacaine was performed, providing pain relief but no clinical change in the penile rigidity. Ultimately, the patient was submitted to a saphenous vein bypass surgery resulting in clinical resolution at the expense of permanent erectile dysfunction.

Discussion: Most cases of priapism are promptly solved after surgical treatment and do not require complex analgesia regimens. Epidural anaesthesia has been rarely described in this scenario. On one hand, therapeutic effects have been reported with priapism resolution after local anaesthetic injection in the epidural space².

On the other hand, epidural analgesia has been described as a possible cause for priapism, in rare cases.

In our case, the epidural technique did not affect the clinical presentation of priapism but provided valuable time for decisionmaking and surgical planning.

Reference:

1. PMID: 24314827; 2. PMID: 8122754

Learning points: This case highlights the complex nature of priapism and the role of the anaesthesiologist in providing multimodal anaesthesia and analgesia in refractory cases.

The recurrence of priapism in the PACU underscores the importance of vigilant monitoring and timely intervention.

11AP08-3

Comparison of nerve stimulator-guided obturator nerve block with or without ultrasound real-time visualization in the transurethral resection of non-muscle-invasive bladder cancer

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Background and goal: Transurethral resection of bladder tumours (TUR-BT) is currently the gold standard surgical treatment. Obturator nerve stimulation during the procedure may lead to obturator reflex with severe complications. The obturator block procedure may be performed by nerve stimulator-guided technique or under real-time ultrasound nerve stimulator-guided technique.

Our study aim is analysing the safety and efficacy of the two different techniques: the nerve stimulator-guided or the ultrasound visualisation and nerve stimulator-guided method.

Materials and methods: We conducted a prospective study within the Urology Department of the Craiova Clinical Emergency Hospital. We initially analysed 247 patients admitted for bladder cancer in our hospital between May 2023 and May 2024.

Patients with muscle invasive bladder cancer (62 cases) and those with non-muscle invasive tumours not suitable for obturator nerve block due to location or type of anaesthesia (70 patients) were excluded.

A total of 115 patients that underwent TUR-BT for NMIBC with ASA status II and III were therefore included in the study: 57 patients with the nerve stimulator guided technique nerve block (group S) and 58 patients with ultrasound and nerve stimulator guided block (group US-S). Patients from both groups received 15 ml bupivacaine 0.25%.

Results and discussion: There were no significant differences between the two patient groups regarding sex, age, BMI, tumour number, size and laterality as well as operating time. All TUR-BT procedures were performed under spinal anaesthesia.

The adductor reflex was present in 44 cases (38%) the majority in group S (30 vs 14 cases, p <0.05). The majority were mild and did not require stopping the procedure (21 vs 9 cases, p<0.05). Significant complications, such as bleeding or bladder perforation was recorded for 14 patients (11 from group S and 3 in group US-S, p<0.05). Incomplete resection (3 cases, 5%) and bladder perforation (4 cases, 7%) were all recorded in the nerve stimulator guided technique group. Significant bleeding was recorded in 11 cases (7 vs 3, p<0.05).

Conclusions: Obturator nerve block is generally a valuable tool that ensures the safety and efficacy of transurethral resection of bladder tumours located on the lateral bladder walls.

Both techniques are safe and easy to perform. The nerve stimulator under ultrasound guided approach leads to significantly lower risk of complications with a higher success rate.

Anesthetic management of an adrenalectomy for phaeochromocytoma

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Background: Intraoperative management of an elective laparoscopic left adrenalectomy for phaeochromocytoma in a patient with MEN 2A syndrome.

Case Report: A 42-year-old woman, diagnosed with MEN2A syndrome, who had previously undergone a total thyroidectomy for medullary thyroid carcinoma and a right adrenalectomy for phaeochromocytoma, presented in March 2024 with two nodules in the left adrenal gland. Catecholamine levels and their metabolites were in borderline values. Laparoscopic surgical removal was the next step chosen.

The Endocrinology team put the patient on alfa adrenergic blockers before the surgery. From an anesthetic perspective, along with the use of standard anesthetic drugs, we followed a combined approach, including a subarachnoid block with 7.5 mg of bupivacaine and 0.1 mg of morphine and intravenous dexmedetomidine (1ug/kg/h) and magnesium sulfate (20 mg/kg) infusion during maintenance. Blood-pressure was invasively monitored. There was no need of hypotensive agents. After the removal, the expected hypotensive phase followed and vasopressors were given.

At the end of the procedure, the patient was extubated and transferred to a level II care unit under vasopressor support. No complications occurred during and after the procedure. The pathology diagnosis was a catecholamine producing phaeochromocytoma.

Discussion: This case illustrates the importance of a combined anesthetic strategy to successfully manage the removal of a suspected phaeochromocytoma. Noxious stimuli and tumor manipulation are the major contributors to the release of catecholamines and subsequent haemodynamic instability.

The subarachnoid block contributed both to pain and hemodynamic control during the surgery due to the vasodilatory effect of local anesthetics. Magnesium sulfate was infused due to its inhibitory effect in the release of catecholamines from the adrenal gland and peripheral nerve endings. Dexmedetomidine, being an alfa-2-adrenergic receptor agonist, has sympatholytic properties that justified its choice.

Reference:

Connor, David et al. Perioperative care of phaeochromocytoma. BJA Education. 2016 May 1;16(5):153–8.

Learning points: A good management of analgesia and haemodynamic changes during adrenalectomy surgery is essential for patient safety.

11AP08-6

Evaluation of 'Sip Til Send' implementation in a London teaching hospital: Implementation and challenges

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Introduction: The Sip Til Send (STS) protocol was first introduced at NHS Tayside in Scotland and has been adopted by several NHS trusts. Building on this success, we conducted a pilot audit at Guy's and St Thomas' Hospital within controlled settings, initially focusing on patients in the Day Surgery Unit (DSU) and Surgical Admission Lounge (SAL) which was subsequently expanded to all preoperative inpatients.

Methods: A pilot audit was conducted from January to May 2023 for patients undergoing elective surgeries. Following approval by the Surgical Safety team and hospital management, STS guideline was implemented.

Interventions were introduced to raise staff awareness and ensure proper adherence to the protocol, allowing patients to sip unlimited clear fluids until they were called to theatre.

A re-audit was carried out in November 2024 to assess compliance with the guideline and identify any wards or surgical specialties that required further attention.

Results and Discussion: In the initial audit cycle, data from 214 patients was analysed, revealing the longest fluid fasting times in pain management (547 minutes) and shortest fasting durations were seen in orthopaedics (180 minutes) with a median fasting time of 347 minutes. Notably, 118 patients (55.1%) fasted for five hours or longer, with 26.2% exceeding ten hours.

Additionally, more than 60% reported feeling thirsty before transfer to the operating theatre.

After implementing the STS guideline, staff education/ teaching sessions, a snapshot audit involving 42 patients, was conducted in November 2024. The longest fasting time was noted as 658 minutes in trauma patients, and shortest fasting time was only 12 minutes in orthopaedics, with a median of 68.5 minutes.

Encouragingly, 79% of patients received water until their transfer to the operating theatre, and only 16% felt thirsty before surgery. There have been no complications reported; however, the primary challenge remains fostering consistency among nurses in offering water and promoting a cultural shift in practice.

Conclusion: This project showcases the effective implementation of a Trust wide STS policy, resulting in a notable decrease in preoperative fluid fasting durations.

However, there were a few outliers where patients experienced unnecessarily extended fasting periods.

We will continue to oversee the policy's implementation, with ongoing staff education aimed at removing any barriers to effective practice.

Patient satisfaction with postoperative services provided by an anaesthesiologists based acute pain care team, in a tertiary hospital of Greece

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Background and Goal of Study: Effective postoperative analgesia is an important metric for evaluating quality of health care services. The goal of this study was to measure patient satisfaction regarding quality of postoperative analgesia services that were provided from an acute pain care team (anaesthesiologists based)

Materials and Methods: After ethical committee approval and written consent, 53 patients who underwent various surgical procedures were recruited. Operation types included: 56% orthopaedics, 23% open abdominal, 6% thoracic, 6% laparoscopic abdominal, 4% gynaecological, and 4% spinal surgery. Postoperatively, 65% of patients received patient-controlled analgesia (PCA), while 35% received epidural analgesia.

An 18-item standardized questionnaire was administered to patients in the ward, on the day that analgesia device was removed. The questionnaire was designed to evaluate three key dimensions:

- 1. Sleep disturbance due to pain and incidence of nausea or vomiting
- 2. Effectiveness of measures taken for pain relief
- 3. Patient satisfaction related to behavior of acute pain care team members.

One question involved possible self-reporting adverse effects and dissatisfaction points on behalf of patients.

Results and Discussion: Concerning dimension (1) 67% of the patients experienced sleep disturbance due to pain, 35% and 15% experienced nausea or vomiting respectively.

As for dimension (2) 86% of the responders were satisfied with the level of postoperative analgesia provided.

Regarding dimension (3) 98% of the responders stated that anesthesiologists did everything possible to alleviate postoperative pain.

Events such as sleep disturbance due to pain and incidence of nausea or vomiting were not statistically correlated with level of patients satisfaction.

However, strong correlation was found between patients' satisfaction and the perception that anesthesiologists were proactive in managing pain (p = 0.012).

Conclusion(s): Patients' satisfaction in the postoperative period can be enhanced by proper and timely pain alleviation. Patients' perception that the anaesthesiologists involved in the acute pain care team did everything possible to alleviate their postoperative pain was the most important parameter for increasing their satisfaction.

Similar studies should be included in order to consolidate these results.

11AP08-8

The hidden threat: Pneumothorax unveiled by abdominal drain migration following thoracoabdominal penetrating trauma

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Background: Thoracoabdominal penetrating trauma is a complex, potentially life-threatening condition. Early diagnosis is crucial for survival, as timely surgical intervention may be required.

Case Report: A 29-year-old male, ASA II, was admitted after being assaulted with a curved fishing harpoon that penetrated the left subcostal region.

Upon arrival, he was hemodynamically stable with no signs of respiratory distress. CT imaging revealed a minor ipsilateral pneumothorax and a possible gastrointestinal perforation. An exploratory laparotomy was performed under general anesthesia.

Ventilation and oxygenation were adequate during surgery, using a protective lung ventilation strategy. The harpoon was removed, a gastrorrhaphy performed, and a drain was placed at the injury site

Post-extubation, the patient presented paradoxical breathing and desaturated to 90%. The drain's collection bag inflated and deflated with his breathing, so it was removed and a three-sided occlusive dressing was applied, immediately improving ventilation and oxygenation.

A chest radiograph revealed the drain had migrated into the thoracic cavity, causing a moderate pneumothorax. After removing the drain and inserting a chest tube, the patient recovered and was discharged after four days.

Discussion: Penetrating trauma is particularly challenging due to the difficulty in predicting the extent of injury and structures involved. In this case, the curved object and its entry point between the thorax and abdominal wall created a unique clinical situation.

Pneumothorax is a common complication, typically worsened by positive pressure ventilation; however, that was not the case here. Instead, it was exacerbated by the surgical drain's occlusion, which had unintentionally migrated into the thoracic cavity.

Timely recognition of respiratory distress and prompt intervention to manage the likely pneumothorax was crucial for a successful outcome.

Reference:

Jain, A., Sekusky, A. L., & Burns, B. (2023). Penetrating Chest Trauma. In *StatPearls*.

Learning points: Managing thoracoabdominal penetrating trauma requires a high index of suspicion for occult injuries, even with unremarkable initial clinical findings.

Vigilant assessment and prompt diagnostics are crucial to detect life-threatening injuries.

Inserting the drain through the injury's entry point can pose additional risks due to its unpredictable trajectory, thus is not recommended.

11AP08-9 Anesthetic considerations in myotonic dystrophy: A case report on urgent surgery

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Background: Myotonic dystrophy type 1 (Steinert's) is a multisystemic autosomal dominant disorder, associated with cardiac and pulmonary complications. These patients have an increased sensitivity to most drugs used during anesthesia, making the anesthetic plan and management extremely challenging.

Case Report: We present the case of a 59-year-old woman, with a two-year diagnosis of myotonic dystrophy, proposed for an urgent femoral artery embolectomy due to acute limb ischemia. The patient had hypercapnic respiratory insufficiency, grade II diastolic disfunction, type 1 obesity and was on dual antiplatelet therapy due to a recent stroke (< 3 months). She had a history of hypercapnic respiratory insufficiency with acidosis in the immediate pos-operative period of a laparoscopic surgery under general anesthesia.

This procedure underwent with monitored anesthesia care (midazolam, fentanyl and ketamine) and local anesthetic infiltration (ropivacaine and lidocaine). Hemodynamic stability and spontaneous ventilation (FiO2 28%) were maintained.

No complications occurred during the procedure. The patient was transferred to the post-anesthesia care unit and a few hours later to the vascular surgery ward.

Discussion: Myotonic dystrophy can pose significant challenges to general anesthesia administration. Local or regional anesthesia diminishes some risks such as cardiopulmonary problems and myotonic crisis triggers.¹

Short action agents should be preferred, titrating doses and close monitoring must be assured.²

In an age when tailored anesthesia is increasingly emphasized, this case demonstrates the significance of attending to both personal and surgical demands, reaffirming the necessity of a patient-centered approach.

References:

- Mangla C, Bais K, Yarmush J. Myotonic Dystrophy and Anesthetic Challenges: A Case Report and Review. Case Rep Anesthesiol. 2019;2019:4282305.
- 2. Morimoto Y, Yoshimatsu A, Yoshimura M. Anesthetic management for a patient with myotonic dystrophy with remimazolam. JA Clin Rep. 2021;7(1):10.

Learning points: Critical role of preoperative assessment in patients with rare diseases (current symptoms and comorbidities, previous contact with anesthesia, problems anticipation) - leading to an individualized anesthesia preparation and proper complications avoidance/management; Adequate team communication, patient cooperation and understanding of available resources

11AP08-10

Improvising in hostile terrain: Excision of giant goiters under opioid-free anesthesia in a low-resource humanitarian setting

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Background and Goal of Study: Thyroid surgery in low-resource environments is particularly challenging due to the limited availability of medications and equipment. This case series describes the outcomes of 10 women with advanced thyroid pathology who underwent subtotal or hemithyroidectomy during a humanitarian mission to Benin, Africa.

This was not the original purpose of the mission, however, on the ground these were the needs of the population. Opioid-free anesthesia (OFA) was used due to the absence of opioids.

Materials and Methods: Patients aged 30–55 years were selected for surgery. The pre-operative evaluation was limited to a clinical examination, a laryngoscopy and a basic laboratory test. A management approach with the only available resources was chosen: General anaesthesia was administered to all patients due to lack of cooperation due to language barrier. The analgesia strategy employed was based on the OFA approach using preincisional and post-closure local wound infiltration combined with intravenous nonsteroidal anti-inflammatory drugs (NSAID).

The primary outcome was the feasibility and safety of the OFA protocol. Secondary outcomes included intraoperative hemodynamic stability, postoperative pain scores, and complications.

Results and Discussion: All surgeries were completed according to our plans. Intraoperative haemodynamics parameters were stable in all patients, with no significant adverse events. Postoperative pain was effectively managed with NSAIDs, achieving a mean visual analogue scale (VAS) score of 1 (range 1-2) at 24 hours. There was only one complication due to the loss of a drain, which required repositioning.

In a humanitarian mission, it is possible to change plans and adapt to the environment according to the needs of the target population. The lack of opioids was mitigated by the effective use of local anaesthetics, highlighting the adaptability of anaesthetic strategies in limited settings. Wound infiltration is a viable alternative for humanitarian missions and may reduce reliance on opioids in certain scenarios.

Conclusion: OFA using NSAIDs and local wound infiltration is a safe and effective anaesthetic approach for thyroid surgery in low-resource settings.

This strategy provides a practical solution to the challenges posed by limited drug availability and offers a model for safe perioperative care in similar environments.

Encéphalopathie de Wernicke survenant précocement après une gastrectomie totale: est-il possible de la détecter et de la prévenir?

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Background: Wernicke's encephalopathy is an acute neuropsychiatric complication secondary to thiamine deficiency. The classic triad is frequently reported in this context, associated with unusual signs. Cerebral involvement typically affects the medial regions of the thalamus and the periaqueductal gray matter, appearing on MRI, which is the reference examination, along with vitamin dosage.

Case Report: We report the case of a patient, 62 years in relatively good nutritional status admitted to postoperative intensive care following a total gastrectomy for gastric adenocarcinoma, who developed postoperative neuropsychiatric disturbances in an incomplete table ultimately suggesting Wernicke's encephalopathy, confirmed by MRI and vitamin B1 dosage.

Discussion: Wernicke's encephalopathy (WE) is an acute neuropsychiatric condition primarily caused by thiamine (vitamin B1) deficiency. Although it is most often seen in chronic alcoholics, WE can also be precipitated by other conditions that lead to nutritional deficiencies, such as malignancies, malabsorption disorders, or major surgeries like a total gastrectomy (TG).

This discussion focuses on the potential for detecting and preventing WE after total gastrectomy, as well as the importance of early intervention.

Detecting WE early in the context of a total gastrectomy can be challenging, as its symptoms may overlap with other postoperative complications, such as delirium or metabolic disturbances. The hallmark symptoms of WE-ataxia, confusion, and ophthalmoplegia-

Routine screening for thiamine deficiency post-surgery could help identify those at higher risk.

Prevention of Wernicke's Encephalopathy After Total Gastrectomy

Prevention of WE following total gastrectomy hinges on addressing the nutritional deficiencies that lead to thiamine deficiency. This can be accomplished through a combination of dietary management, supplementation, and regular monitoring.

References:

- 1. Wernicke's encephalopathy following sleeve gastrectomy for morbid obesity
- A. Landais aG. Saint-Georges b
- 2. Wernicke's encephalopathy after sleeve gastrectomy : a matter of life ophthalmological diagnosis
- B. Preud'homme¹, F. Depasse², L. Vauthier² et M. Cordonnier ¹Service d'Ophtalmologie, Hôpital Erasme, Université libre de Bruxelles (ULB), ²Service

d'Ophtalmologie, Hôpital civil Marie Curie, C.H.U. de Charleroi **Learning points:** Wernicke's encephalopathy post-gastrectomy.

11AP08-12

Identification of high-risk groups of surgical patients using unsupervised learning from administrative electronic health record data

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Background and Goal of Study: At 4%, the European average for perioperative mortality is relatively high (1). A rapid and correct risk assessment is important to institute appropriate clinical management, and machine learning can help with this task (2). The aim of this study is to identify risk groups of surgical patients purely from preoperative administrative data that can be easily extracted from electronic patient records

Materials and Methods: We included 179.135 patients undergoing planned and emergency non-cardiac surgery at a German university hospital between June 2014 and December 2022 (ethics number 253/19 S-SR). Only administrative data from the EHR was included as input for a k-means clustering algorithm: age, sex, reason for admission, admitting department, type of surgery or intervention, date and daytime of surgery.

Results and Discussion: We obtained 5 clusters: cluster 1 with predominantly older (median age 69) emergency patients (76,6% emergency admissions), cluster 2 containing rather older patients (median age 65) with a high proportion of general surgery, cluster 3 consisting of rather younger patients with a high proportion of trauma and orthopaedic procedures, cluster 4 with predominantly gynaecological (99,9% female patients, median age 35) and cluster 5 with older, urological patients (median age 65) (Table 1). All clusters differed significantly in mortality and the need for postoperative intensive care (Figure 1).

Cluster	·	. 2		and the same	5	p-value
de la companya del companya de la companya del companya de la comp	N=9,218	N = 28,063	N=117,178	N = 8,497	N=16,179	
Sex female	43.5%	51.0%	45.4%	99.9%	16.1%	<0.001
Age (Median, IQR)	69 (54, 79)	65 (53, 74)	55 (36, 70)	33 (30, 36)	85 (54, 74)	<0.001
Emergency admission	76.6%	23.7%	25.5%	1.0%	13.4%	<0.001
Weekend	22.2%	3.1%	4.2%	21.2%	1.6%	<0.001
Standard duty	55.1%	91.0%	88.2%	51.4%	93.8%	<0.001
Admission from external hospital	9.6%	1.5%	2.7%	0.2%	0.6%	<0.001

Table 1. Descriptive statistics of all obtained clusters. Baseline data for all 5 clusters including: age, sex, reason for admission, date and daytime of surgery.

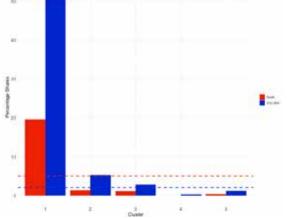


Figure 1. Mortality and ICU-Admission rate after clusterization. The bar chart represents the fraction of postoperative mortality and post-operative ICU admission. ICU = Intensive care unit.

Conclusion(s): Unsupervised machine learning applied to administrative data enables the identification of risk groups in patients undergoing non-cardiac surgery. These methods thus have the potential to be used as automatic triage tools at hospital admission.

References:

- 1. Pearse RM et. al, Lancet. 380, 1059-65.
- 2. Xie F et. al, British Medical Journal Open, 9(9)

11AP09-1

Low opioid anesthesia combined with loco-regional anesthesia: A successful alternative in patients undergoing oncological surgery and allergic to muscle relaxants

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Background: Patients with a history of anaphylaxis to NMBA can be a challenge to anesthesiologists. Major abdominal surgery is generally carried out under general anesthesia.

Specially those performed by laparotomy due to the substantial insult of the approach and to facilitate organ relaxation and paralysis. Locoregional anesthesia offers a means of providing anesthesia without using NMBAs (1).

Case Report: An 88-year-old male patient (ASA III; 83 kg; 167 cm) who was scheduled for laparotomic hemicolectomy and reparation of an incisional abdominal wall hernia, had a history of anaphylaxis to NMBAs. We planned a multimodal anesthesia with locoregional anesthesia: first, we placed a thoracic epidural catheter; then at L3-4 level, we administered 15mg intradural Bupivacaine.

We administered as in a LOA protocol: Midazolam, Magnesium Sulfate, Dexketoprofen, Dexamethasone, and IV Lidocaine. While preoxygenating for 2 minutes we started Remifentanil TCI. We induced general anesthesia with Propofol and completed 5min mask ventilation with 100% oxygen and 4% Sevoflurane.

After confirming no more self-ventilation, we performed the laringoscopy with an Airtraq device. Intubation condition was good. General anesthesia was maintained with Sevoflurane, Magnesium Sulfate infusion, and Remifentanil TCI. Intervention time was 4h. The surgeon felt no difference from patients under relaxation with NMBAs.

At the end of surgery, gave 1g of Paracetamol. The patient recovered in less than 10min after the cessation of drugs and was extubated without complications. We used an epidural pump of Ropivacaine 48h. He was discharged after 6 days without complications.

Discussion: Combination of general and loco-regional anesthesia would translate into lower metabolic and endocrine responses to stress and better pain control (2).

Laparotomy under locoregional anesthesia resulted safe and feasible. Intradural anesthesia has advantages over epidural anesthesia.

Amongst the drugs at our reach, we chose those which would provide a greater muscle relaxation whilst keeping in sight our goal of an enhanced recovery. Induction without NMBAs was successful under videolaryngoscopy (3).

Reference:

Coe C. Locoregional Anaesthesia for Laparotomy: A Literature Review and Subsequent Case Series Highlighting the Potential of an Alternative Anaesthetic Technique. Cureus. 2023 Sep 19:15(9):e45529

Learning points: LOA general anesthesia and locoregional anesthesia are an option in allergies.

11AP09-2

Effects on perioperative blood glucose in patients with type 2 diabetes mellitus according to different anesthesia methods: a PRISMA-compliant systematic review and meta-analysis

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Background and Goal of Study: To evaluate the impact of intravenous and inhalation anesthesia on blood glucose in patients with type 2 diabetes mellitus undergoing surgery.

Materials and Methods:

Design: A systematic review and meta-analysis of randomized controlled trials. Medline, EMBASE, CENTRAL, and Google were searched from inception up to 14 October 2024.

Setting: Operating room, postoperative recovery area, and ward, up to 2 days after surgery.

Patients: patients with type 2 diabetes mellitus undergoing surgery.

Interventions: We used Comprehensive Meta-Analysis version 2.0 to pool the data with fixed or random effects model. The quality of evidence was rated using the Grading of Recommendations, Assessment, Development and Evaluation system. Two researchers in 1 group independently screened literatures with eligibility criteria, extracted information, and used RevMan5.3 software to perform a meta-analysis.

Measurements: The primary outcomes were combined intraoperative blood glucose in patients with type 2 diabetes mellitus at multiple time points. The secondary outcomes included blood glucose at each time point during surgery and after surgery, and inflammation factors and cortisol.

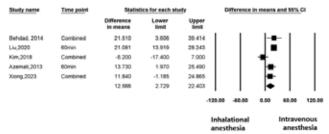


Figure 1. Blood glucose levels comparison by intravenous and inhalation anesthesia.

Results and Discussion: Five studies involving 512 participants were included. The meta-analysis results suggested that compared with inhalation anesthesia, intravenous anesthesia has better glycemic control in combined intraoperative blood glucose levels (WMD 1.26, 95% confidence interval [CI] _1.77 to 0.76). However, there was no evidence of a difference in blood glucose level after surgery (MD_7.379, 95% CI_-34.01 to 48.76).

Conclusion(s): Existing evidence showed that compared with inhalation anesthesia, intravenous anesthesia has better glycemic control in intraoperative blood glucose levels.

11AP09-3

Obstructive sleep apnea syndrome resolved by lobectomy: insights from a clinical case

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Background: Obstructive sleep apnea syndrome (OSAS) involves recurrent upper airway obstruction during sleep. Common risk factors include obesity, nasal obstruction, adenoid/tonsil hypertrophy, and hypothyroidism. However, the role of large thyroid goiters, independent of hypothyroidism, in OSAS remains unclear. While thyroidectomy has been reported to alleviate OSAS symptoms, the relationship between goiter size and OSAS, particularly in males, is underexplored.

Case report: A 72-year-old male with a BMI of 37, hypertension, metabolic syndrome, and OSAS (AHI 39 supine, 9 lateral) diagnosed a year earlier presented for thyroid surgery. Despite being euthyroid, he had a left thyroid lobe measuring 4/4.5 cm on ultrasound, fully nodular, with biopsy findings suggestive of malignancy. The right lobe was normal.

Preoperative CPAP therapy had been initiated 11 months earlier. Intraoperatively, the left lobe measured 15/10/12 cm, extended retrosternally, and displaced the trachea rightward. Post-lobectomy, the patient reported improved breathing, with $SpO_2 \ge 93\%$ on room air and an AHI of 13 supine and <5 lateral.

Discussion: This case underscores the potential role of large thyroid goiters in OSAS pathogenesis, even in euthyroid patients. While other risk factors persisted, significant improvement in polysomnographic and clinical outcomes was observed postoperatively.

This highlights the need to consider thyroid enlargement in OSAS evaluation. Discrepancies between ultrasound and actual thyroid size suggest that CT imaging may be more reliable.

Further studies are warranted to clarify the impact of thyroid pathology on OSAS and refine diagnostic protocols.

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3. Masarwy, R., Kampel, L., Ungar, O.J. et al. The impact of thyroidectomy on obstructive sleep apnea: a systematic review and meta-analysis. Eur Arch Otorhinolaryngol 279, 5801–5811 (2022)

Learning points: This case suggests a link between thyroid goiters and OSAS, even in euthyroid patients, highlighting the value of CT for accurate thyroid assessment in OSAS diagnosis.

11AP09-4

The role of pharmacogenetics in patients with severe postoperative nausea, vomiting, and pain following general anaesthesia: concept of a pilot study

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Background and Goal of Study: Despite advancements in anaesthesiology, postoperative nausea and vomiting (PONV) remain prevalent, affecting over 27% of patients, while severe postoperative pain impacts approximately 32%, even in the implementation of standardized prevention protocols. These outcomes suggest that genetic polymorphisms may play a critical role - although their effect remain unclear. Studies on polymorphisms in gene locations like CYP2D6, crucial for drug metabolism in anaesthesia, reveal deviations of 20–30%. These findings highlight the possible relevance of pharmacogenetics in perioperative care.

The objective of our ongoing proof-of-concept-study is to examine pharmacogenetics as a factor contributing to severe adverse events. We present a pilot study investigating the prevalence of genetic polymorphisms in patients suffering from severe PONV or postoperative pain following general anaesthesia. By analysing specific gene loci associated with anaesthetic and analgesic drug metabolism and pharmacodynamics, this study represents a pioneer study to clinically examine how pharmacogenetic variability influences severe side effects.

Methods: The cohort includes 50 patients treated at a teaching hospital, with recruitment concluding in early 2025. Participants are divided into two groups: 25 patients with severe PONV and 25 patients with intense postoperative pain (NRS \geq 6/10). Defined inclusion and exclusion criteria ensure consistent patient selection. Blood or saliva samples undergo whole-genome sequencing targeting a defined gene panel associated with drug metabolism and pharmacodynamics. The rate of polymorphisms in the study cohort is compared to an Austrian average population using a pharmacogenetic laboratory database.

Results and Discussion: We anticipate a higher prevalence of genetic polymorphisms in patients with severe PONV or postoperative pain compared to an average population. This is used to validate the concept of this pilot study. Preliminary data provide insight into the genetic factors to perioperative side effects and support the development of personalized interventions.

Conclusions: This pilot study introduces a novel approach to understanding the genetic basis of severe postoperative side effects. Findings from 50 patients are presented and provide valuable data for a planned clinical controlled study. We will address the potential of pharmacogenetics in enhancing anaesthetic tolerability and optimising perioperative care.

11AP09-6

Evaluation of lung ultrasound as a screening tool to detect early post operative pulmonary complications following major upper open abdominal surgeries

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Background and Goal of Study: Early, post-operative pulmonary complications have a detrimental effect on the outcomes of all major surgeries, hence their screening through sensitive modalities is very important. The goal of the study is to evaluate usefulness of Lung Ultrasound as a screening tool for detection of early post-operative complications following major upper open abdominal surgeries.

Materials and Methods: In this prospective observational study, a total of 100 patients (20-65 years) were scheduled to undergo major upper open abdominal surgeries. Preoperative Lung Ultrasound (USG) and Chest X-ray were performed in all the patients and were subsequently screened for pulmonary complications on post-op. day 1, 2 and 3 using Lung USG and Chest X-ray. Pulmonary effusion, consolidation and interstitial abnormalities were noted. Cumulative incidence of lung abnormalities was also noted. Statistical analysis- Detection rate for pulmonary complications was compared between Chest X-ray and Lung USG using Chi-square test.

Results and Discussion: As per Lung USG, incidence of pulmonary abnormalities was 48%. Compared to this Chest X-ray screened pulmonary abnormalities in 18% cases only. Pleural effusion, consolidation and interstitial abnormalities were detected in 35%, 22% and 48% using lung USG and 18%, 9% and 0% respectively using Chest X-ray. There was a significant difference in detection rates of pulmonary abnormalities between two modalities (p<0.001

Conclusion(s): Lung USG was a highly sensitive imaging modality, particularly for detection of interstitial pulmonary abnormalities which remained almost undetected on Chest X-ray.

11AP09-7

Incidence of Postoperative Nausea and Vomiting in bariatric surgery

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Background and Goal of Study: Postoperative nausea and vomiting (PONV) is a common complication in bariatric surgery. ERAS guidelines¹ and a position statement endorsed by professional societies² recommend implementing universal prophylaxis with two or three antiemetics.

This study implements a universal PONV prevention protocol comprising three agents from different antiemetic classes: a glucocorticoid, a 5-HT3 antagonist, and a butyrophenone.

Materials and Methods: A retrospective analysis was performed on the records of 1,051 patients who underwent bariatric surgery, including laparoscopic sleeve gastrectomy, Roux-en-Y gastric bypass, one-anastomosis gastric bypass, single-anastomosis sleeve-ileal bypass, or revision surgery. All patients received 8 mg of dexamethasone during anesthesia induction, 1 mg of granisetron, and 1 mg of droperidol at the end of surgery. PONV incidence was defined by the need for rescue antiemetics postoperatively. Adjusted logistic regression analysis evaluated risk factors.

Results and Discussion: Most patients were female (84%), with a median age of 42 (range 18–80) and a median BMI of 37.6 (IQR 34.6–42.3). The overall PONV incidence was 38%. Risk factors associated with an increased likelihood of PONV included female sex (OR 2.52, 95% CI 1.69–3.83), type of surgery (laparoscopic sleeve gastrectomy OR 2.20, 95% CI 1.42–3.42), non-smoking status (OR 1.51, 95% CI 1.05–2.18), and postoperative opioid use (OR 1.07, 95% CI 1.04–1.10). Total intravenous anesthesia did not appear to provide additional protective effects when three antiemetics were used (p = 0.347).

Conclusion(s): Clinically significant PONV continues to occur in over one-third of bariatric surgery patients, despite implementing a liberal, universal antiemetic prophylaxis protocol. Further research and efforts to mitigate PONV risk are necessary.

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11AP09-8

Association between pre-operative use of selective alpha 1 blockers and intraoperative hypotension

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Background and Goal of Study: Selective alpha-1 blockers (SAB) are widely prescribed for lower urinary tract symptoms. While associated with adverse effects of orthostatic hypotension, current literature supports their safe continuation in surgical patients. However, isolated case reports suggest a potential association between selective alpha-1 blockers and intraoperative hypotension (IOH), which in turn is associated with significant postoperative complications. We aimed to investigate the association between preoperative SAB use and the incidence of IOH, as well as its relationship with a composite secondary outcome including myocardial injury after non-cardiac surgery, acute kidney injury, stroke, and 30-day mortality.

Materials and Methods: Single-center retrospective cohort study analyzing data of male patients > 50 years of age who had non-cardiac surgery. Exposure of interest was pre-operative prescription of SAB, and the primary outcome was time-weighted average (TWA) under mean arterial pressure (MAP) of 65 mmHg. IOH was also quantified as minutes under MAP of 65. Multivariable logistic regression was utilized to adjust for potential confounders.

Results and Discussion: Among 28,705 cases analyzed, 6,303 (22%) patients used SAB preoperatively, and 22,402 (78%) did not. The SAB group exhibited lower average MAP (81 mmHg vs. 82 mmHg, p=0.001) and spent more time under a MAP of 65 mmHg (median 4 vs. 3 minutes per hour, p=0.001). The primary outcome (TWA under MAP 65) was significantly greater in the study group (0.30 mmHg, 95% CI 0.00-1.01) compared to the control group (0.22 mmHg, 95% CI 0.00-0.83, p<0.001) and remained so after adjusting for potential confounders. Univariate analysis also demonstrated a crude association with the composite secondary outcome (9% vs 7% p<0.001), However this association became non-significant after adjusting for potential confounders (OR 1.1, 95% CI 0.98 to 1.24, p=0.091).

Conclusion(s): In this large retrospective cohort study, chronic use of SAB was associated with more IOH, lower mean blood pressure, and longer durations of hypotension.

Nonetheless, it was not associated with a composite of adverse postoperative events, which might indicate that SAB serve as markers for higher-risk patients rather than exerting a direct effect on postoperative complications.

Further prospective studies may elucidate the causal relationship between SAB and IOH as well as the clinical significance of these findings.

11AP09-9

Assessing efficacy of intravenous acetaminophen for perioperative pain treatment in spinal surgery

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Background and Goal of Study: Intravenous Acetaminophen (IVA) is an effective medication for primary and adjunctive pain management and has demonstrated reductions in total morphine consumption.

The main objective of this study was to investigate the effectiveness of IVA in relieving pain, reducing opioid use, shortening hospital stay, and improving patient satisfaction.

Materials and Methods: This randomized, quadruple-blinded, controlled, single-site, parallel-arm superiority trial was conducted to investigate the effect of IVA on reducing pain scores and several other secondary outcome measures. 60 consented spinal surgery patients were randomized by the research pharmacy into the placebo or acetaminophen group. Within 30 minutes of surgical closure, participants received either 1-gram IVA or placebo (0.9% saline). There were 3 patients found ineligible and removed from the trial.

Superiority testing was used to examine the differences between the two treatment arms for the primary and all secondary outcomes. Multiple forms of regression analysis conditional on treatment group assignment and several a priori selected prognostic variables, age, sex, preoperative opioid use, and preoperative pain, were used to estimate IVA's effect on the outcomes.

Results and Discussion: Imbalance between the placebo and acetaminophen group was observed in several of these characteristics, including preoperative pain (median 3.0 [2.0, 5.3] vs. 4.0 [2.0, 6.0]; SMD = 0.179), preoperative NSAIDS (14.3 % vs. vs. 27.6 %; SMD = 0.331), and pre-anesthetic medications (10.7 % vs. 25.9 %; SMD = 0.401).

Primary and secondary outcomes estimated from regression models conditional on treatment and prognostic variables are captured. The worst numerical pain score (primary outcome; 0 to 10 scale) was higher in the acetaminophen group compared to the placebo group, adjusted difference: 0.54 (95%Cl: -0.87, 1,97), p = 0.452. Patient satisfaction was estimated to be lower in the acetaminophen group compared to the placebo group (Estimate: -1.11, 95% Cl: -2.06, -0.17; P = 0.021).

Conclusion(s): Our study findings suggest that incorporating IVA into existing opioid-based perioperative pain management strategies may not provide substantial relief for postoperative pain. Thus, adding IVA to existing perioperative pain management strategies is unlikely to meaningfully reduce postoperative pain.

11AP09-10

Assessment of postoperative nausea and vomiting in the early postoperative period

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Background and Goal of Study: Postoperative nausea and vomiting (PONV) is still a common complication of general anesthesia and a significant cause of preoperative fear in patients. After pain, PONV is the second most frequent complaint in the early postoperative period. It delays recovery room discharge.

The aim of this study is to examine the incidence of PONV in the early postoperative period, risk factors that are most significant in predicting early PONV and the association between acute postoperative pain and early PONV.

Materials and Methods: The research was conducted on Clinic of Anesthesia, Intensive Therapy and Pain Therapy, University Clinical Centre of Vojvodina, Serbia as a cross-sectional observational study that included 150 patients from elective program of abdominal, plastic, maxillofacial, vascular, and neurosurgery. Brief history was taken, and a survey was conducted on early PONV and acute postoperative pain. Necessary data from medical history and anesthesia protocol were recorded in the research protocol.

For primary data analysis there were used descriptive statistical methods, methods for testing correlations and methods for testing predictive abilities.

Results and Discussion: Out of 150 patients, PONV occurred in 36 patients (24%), which correlates with data from the literature. Patients most often rated the severity of nausea as 3 on the numerical rating scale. Risk factors that can be related to the occurrence of PONV are history of motion sickness, use of opioids postoperatively, and antidiabetic medication. The first two are well-known risk factors for the development of PONV, they are even part of the well-known Apfel score. In our study we came to conclusion that motion sickness increases the chance of early PONV by 4.2 times, and the use of opioids by as much as 5.7 times. Regarding diabetes therapy, these results can be explained by delayed gastric emptying due to autonomic neuropathy and hyperglycemia in diabetics.

There is a slight correlation between the severity of acute postoperative pain and PONV, and between Apfel score and PONV.

Conclusion(s): The incidence of postoperative nausea and vomiting is 24%. Most significant factors in prediction of early PONV are presence of motion sickness, postoperative use of opioids, and use of antidiabetic medication. Occurrence and severity of early PONV is related to the severity of acute postoperative pain.

11AP09-12

Caffeine-induced masseter spasm as a controversial risk factor for MH? Internal audit

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Background and Goal of Study: Masseter spasm after triggers is one of the early signs of malignant hyperthermia (MH). Historically, probably because caffeine is used as one of the substances during In vitro contracture test (IVCT), "caffeine intolerance" was believed to be a risk factor for MH in Czechia. After drinking coffee, some patients referred to masseter twitching, spasms or jaw trismus. Caffeine is a stimulant and can increase susceptibility to muscle cramps (1). Although the exact pathophysiological mechanism is still subject to debate, the potentiation of muscle contraction via induction of sarcoplasmic reticulum calcium release is well established (2). The controversy is that we could not find any similarities in other cohorts of MH patients worldwide. To reveal the facts, we conducted an internal audit at the MH centre in Brno, Czechia.

Materials and Methods: In this retrospective observational internal audit, we screened 303 patients referred to our MH centre from 2002 to 2022. Probands were investigated depending on the valid MH diagnostic criteria. Inclusion criteria for further analysis included a caffeine intolerance as a reason for referral. The data were reported descriptively using Microsoft 365. We also performed a literature review to detect the source of "caffeine-induced jaw spasm is an MH risk factor" information.

Results and Discussion: The jaw trismus after drinking black coffee was listed as a possible MH risk factor in the first Czech "modern" textbook of Anaesthesiology from 1981(3) and in the Czech translation of the 5th edition of Larsen's Anaesthesia textbook from 1998. 24 probands were referred to our MH centre based on any form of caffeine intolerance. IVCT was performed in 19, four (21%) were MH susceptible (MHS). None of the MHS patients had other MH risk factors. Genetic screening detected only one variant of unknown significance in the RYR1 gene.

Conclusion(s): With about a fifth MHS probands, our data does not confidently rule out a controversial potential connection between caffeine-induced jaw spasms and MH risk.

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Acknowledgements: This research was funded by Specific University Research (MUNI/A/1595/2023; MUNI/A/1551/2023), and RVO (FNBr, 65269705).

11AP10-1

Incidence and risk factors of preoperative hyponatremia in patient underwent urgency tracheostomy: a retrospective study

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Background and Goal of Study: Hyponatremia is a frequently encountered electrolyte disturbance in surgical patients. It is found to be associated with elevated risks of complication during the perioperative period. Despite its association with poor outcomes in critically ill patients, there was no study on the association between preoperative hyponatremia and urgent tracheostomy.

This study aims to evaluate the incidence of preoperative hyponatremia prior to urgent tracheostomy, identify its risk factors and related complications.

Materials and Methods: We retrospectively reviewed adult patients underwent urgency tracheostomy with confirmed hyponatremia (serum sodium [Na] under 135) within 48 hours preoperatively during 10 years (2014-2023), and identified the risk factors and related complications using chi-square tests and logistic regression models.

Results and Discussion: Among 288 adult patients undergoing urgent tracheostomy, 129 patients presented with preoperative hyponatremia (44.8%), with the severity graded as follows: 29.2% mild (Na; 130-134 mmol/L), 6.6% moderate (Na; 125-129 mmol/L), and 9.0% severe hyponatremia (Na less than 125 mmol/L). The significant risk factors were body mass index (BMI) under 18.5 kg/m² (odds ratio [OR]: 2.24; 95% Confidence Interval [CI]: 1.35-3.70; p=0.002) and American Society of Anesthesiologists physical status of III-IV (OR: 2.15; 95% CI: 1.26-3.65; p=0.005). Factors including old age (OR: 0.69; 95% CI: 0.42-1.14; p=0.146), malignancy (OR: 1.61; 95% CI: 0.91-2.86; p=0.103), or others were not found significantly related. There was no complication significantly found associated with preoperative hyponatremia in patients undergoing urgent tracheostomy.

Conclusion(s): Almost half of the adult patients undergoing urgent tracheostomy had preoperative hyponatremia. Low BMI and advanced ASA classifications significantly increased the likelihood. However, preoperative hyponatremia was not found associated with perioperative complication in patients undergoing urgent tracheostomy.

11AP10-2

Influence of intraoperative nociception guided analgesia on perioperative analgesia consumption in patients undergoing laparoscopic resection of endometriosis

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Background and Goal of Study: The absence of objective intraoperative nociception monitoring limits anaesthesia providers to using physiological markers, such as tachycardia and hypertension, as surrogates for nociception. This can lead to suboptimal analgesic administration, affecting postoperative outcomes. Recent innovations, such as the Nociception Level (NOL®) index, allow for a quantifiable measure of nociception, offering a potential solution. Patients being scheduled for endometriosis surgery do have a significant history of chronic pain thus being more prone to difficulties in postoperative pain management and therefore will benefit the most from a tailored analgesic regimen.

This study aims to determine whether nociception monitoring with NOL can optimize perioperative analgesia in patients undergoing laparoscopic endometriosis surgery without exacerbating postoperative pain and minimizing side effects of analgetic medication.

Materials and Methods: This prospective randomized, controlled trial is being conducted at Spital Limmattal (Zurich-Schlieren, Switzerland) between August 2024 and is expected to end in December 2025 and includes patients undergoing laparoscopic endometriosis surgery. Every patient was blinded regarding group assignment.

Both groups received a standardized multimodal analgesic regimen and underwent nociceptive monitoring with the NOL device. In the control group, the NOL monitor was blinded, while in the intervention group, analgesia was adjusted based on real-time NOL values to maintain a target range of 10-25.

The primary outcome was total analgesic consumption. Secondary outcomes included length of stay in the post-anaesthesia care unit (PACU) and PACU pain scores.

Results: Preliminary analysis using standardized statistical methods demonstrated a significant reduction in total intraoperative remifentanil consumption in the intervention group using nociception sensor-guided analgesia. For the examined secondary outcomes, postoperative pain scores and length of stay in the PACU, no significant difference could be shown so far.

Discussion and Conclusion: Nociception sensor-guided analgesia decreases opioid use thus decreasing opioid-related complications and improving patient related outcome.

While the randomized design strengthens the findings, limitations such as sample size and generalizability warrant further research to assess long-term outcomes, cost-effectiveness, and broader applicability in clinical practice.

11AP10-3

Multimodal general anesthesia with dexmedetomidine for endonasal surgery in paroxsysmal nocturnal hemoglobinuria (PNH): a case report

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Background: PNH is a rare stem cell disorder, in which surgery and anesthesia can trigger complement system activation, hemolysis and thrombosis.¹

We report a case of a successful management of a patient who underwent general multimodal anesthesia with dexmedetomidine for endonasal surgery.

Case report: A 54-year-old woman with PNH was scheduled for endonasal surgery and exodontias due to recurrent sinus and teeth infections that triggered multiple hemolytic crisis. Prior intraabdominal venous thrombosis led to portal hypertension, splenomegaly and thrombocytopenia. Previous surgical history included a uretherorenoscopy, halted due to critical hemorrhage. Current medication included eculizumab, prednisolone and acenocumarol.

Patient was monitored according to ASA standards plus invasive arterial pressure, ToFscan $^\circ$, Sedline $^\circ$ and O $_3$ $^\circ$. General anesthesia was induced with target-controlled infusion of remifentanil, lidocaine (1mg/kg), propofol and rocuronium, and maintained with sevoflurane and an infusion of dexmedetomidine (DEX) at 0.4mcg/Kg/h.

Multimodal analgesia included also paracetamol and tramadol. A maxillary sinusotomy, anterior and posterior ethmoidectomy and multiple exodontias were performed with minimal blood loss.

At the end, laboratory analysis showed similar LDH and bilirubin levels. The postoperative period was uneventful, and patient was discharged on the fourth postoperative day.

Discussion: PNH is a rare acquired hematopoietic stem cell disease caused by a mutation in PIGA gene, that results in chronic complement-mediated intravascular hemolysis and hemoglobinuria. Free hemoglobin predisposes patients to thrombosis, especially venous. Infections and inflammation can trigger hemolysis by activating complement system and, for that, surgery and anesthesia are considered potential risk factors².

The literature is sparse regarding best anesthetic approach. However, the main goal is to avoid a hemolytic crisis. To our knowledge, this was the first case in which DEX was used in PNH. Studies have shown DEX's direct anti-inflammatory effect, reducing the expression of pro-inflammatory mediators and increasing the level of anti-inflammatory mediators³.

We hypothesized that DEX could attenuate complement activation and reduce complications.

Learning points: Anesthetic management of patients with PHN is complex. The use of DEX could be a safe alternative, by reducing surgical stress and possibly complement activation and hemolytic crisis.

11AP10-4

Features of the clinical course of the postoperative period in patients with Cardiovascular-Kidney-Metabolic syndrome

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Background: Recently introduced concept of Cardiovascular-Kidney-Metabolic Syndrome (CVKMS) is defined as a health disorder associated with obesity, diabetes mellitus, chronic kidney disease, cardiovascular disease, and aims to improve a multidisciplinary approach to the prevention, risk stratification, and treatment of these disorders.

Goal of Study: To substantiate the feasibility for selection of CVKMS within the framework of metabolic syndrome (MetS) in anesthesiologic support of non-cardiac operations in high-risk patients.

Materials and Methods: One hundred and two patients were divided into the CVKMS group (n = 34) and the (MetS) group (n = 68). The severity of postoperative complications was classified according to the Clavien-Dindo definitions. The length of postoperative stay was calculated.

Results and Discussion: Patients with CVKMS had a significantly higher rate of metabolic syndrome components: arterial hypertension, obesity, and diabetes mellitus (p < 0.005 for all comparisons). The total number of patients with complications, the rate of postoperative complications of Clavien–Dindo grade II and III was significantly higher in the CVKMS group (p = 0.005; p = 0.001 and p < 0.001; respectively). The length of postoperative stay was significantly longer in the CVKMS group (p = 0.022).

Conclusion: Compared to patients with MetS, patients with CVKMS have a higher incidence of perioperative adverse events and longer hospitalization after non-cardiac surgery. This indicates the expediency of taking it into account when providing anesthesia support in high-risk patients.

Keywords: cardiovascular-kidney-metabolic syndrome; non-cardiac surgery; complications; outcomes

11AP10-5

Perioperative management of myotonic dystrophy: tailored approaches to general anaesthesia – a case report

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Background: Myotonic dystrophy (MD) is a rare (2–14/100,000) autosomal dominant multisystem disorder. It ranges from fatal congenital myopathy to late-onset forms where cataracts may be the only symptom. Classic features include myotonia and progressive muscle weakness, often affecting facial, respiratory, laryngeal, axial, and distal limb muscles, with symptoms worsened by stress, pain, cold, or succinylcholine. MD frequently involves the cardiac and respiratory systems, complicating anesthetic management due to hypersensitivity to hypnotics and paralytics. Case reports suggest a possible link between MD and malignant hyperthermia.¹²

Case Report: A 41yo female, ASA III, was admitted for elective hemithyroidectomy. She had a history of MD type I (Steinert's syndrome) with facial and upper limb diparesis, particularly affecting her hands. She had no prior surgeries or anesthesias and denied dyspnea, dysphagia, or dysphonia.

Anesthesia induction was performed with 2mg midazolam, 100mcg fentanyl, 200mg propofol, and 50mg rocuronium, followed by orotracheal intubation. Maintenance was achieved with propofol infusion, adjusted using Bispectral Index* monitoring, and 20mg boluses of rocuronium as needed.

Analgesia included 1g paracetamol, 100mg tramadol, and 30mg ketorolac. The patient remained normothermic and hemodynamically stable.

At the procedure's end, 400mg sugammadex were administered, achieving a TOF ratio >0.9. She was extubated after recovery of motor strength and airway reflexes and transferred to the post-anesthesia care unit.

Discussion: MD is associated with high perioperative morbidity and mortality, primarily due to cardiovascular and respiratory complications. Hypersensitivity to sedatives and paralytics increases risks of ventilatory dysfunction, delayed muscle recovery, pharyngeal dysfunction, and aspiration. To mitigate these, short-acting drugs are recommended to allow rapid recovery of consciousness and muscle strength.²

References:

- 1. Ferschl M *et all*. Pratical suggestions for the anesthetic management of a myotonic dystrophy patient. *Myotonic Dystrophy Foundation*. 2016.
- 2. Catena V et all. Anesthesia and myotonic dystrophy (Steinert's syndrome). The role of total intravenous anesthesia with propofol, cisatracurium and remifentanyl. Case report. Minerva Anestesiol. 2007 Sep;73(9):475-9. PMID: 17660741.

Learning Points: Perioperative monitoring and preparation for complications are essential for optimal MD patient outcomes.

11AP11-1

Comparison effectiveness of topical analgesics with and without Entonox® for esophagogastroduodenoscopy - a randomized controlled trial

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Background and Goal of Study: Esophagogastroduodenoscopy (EGD) is vital for diagnosing and treating upper gastrointestinal symptoms, but patient discomfort and anxiety can affect procedural outcomes.

This study aimed to compare the effectiveness of topical analgesics with and without Entonox® during EGD in terms of procedural success, patient tolerance, and satisfaction.

Materials and Methods: A prospective, randomized controlled trial was conducted with 212 patients undergoing elective EGD. Patients were randomly assigned to receive either 10% xylocaine spray alone (Group C) or 10% xylocaine spray combined with Entonox* (Group E). Data on demographics, previous EGD experiences, and side effects were collected. Procedural success and patient comfort were evaluated using the Bath Gastroscopy Toleration Score (GTS) and Patient Comfort Scores (PCS), with scores of 0 or 1 indicating success. Satisfaction was measured using the Numeric Rating Scale (NRS), where scores of 7 or higher indicated high satisfaction.

Results and Discussion: A total of 211 patients underwent EGD successfully (Group C=106, Group E=105). Patients in Group E demonstrated a significantly higher proportion of success rate (76.2% vs 35.9%, P < 0.001), better toleration score (82.9% vs 75.5%, P = 0.004), and better patient comfort score (86.7% vs 39.6%, P < 0.001) compared to Group C. Endoscopists and patients in Group E expressed higher satisfaction levels (9 vs. 8, P < 0.01 and 9 vs. 8, P < 0.01).

Side effects of Entonox® were minimal. Notably, patients in Group E had a lower proportion of high blood pressure and tachycardia during the procedure (*P* < 0.001).

Conclusion(s): Combining Entonox® with topical analgesics significantly improves tolerance, satisfaction, and procedural success during EGD, offering a safe and effective option for managing patient discomfort and anxiety.

References:

Dammer U, Weiss C, Raabe E *et al.* Introduction of inhaled nitrous oxide and oxygen for pain management during labour - evaluation of patients' and midwives' satisfaction. *Geburtshilfe Frauenheilkd* 2014; 74: 656-60.

Martin JP, Sexton BF, Saunders BP, Atkin WS. Inhaled patient-administered nitrous oxide/oxygen mixture does not impair driving ability when used as analgesia during screening flexible sigmoidoscopy. *Gastrointest Endosc* 2000; 51: 701-3.

Acknowledgements: Dr. Orawan Supapueng for her invaluable advice and expertise in statistical analysis

11AP11-2 Anaesthesia management in Kennedy's disease. A case report

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Background: Kennedy's Disease (KD) is a rare condition characterised by bulbar and spinal muscular atrophy, predisposing to laryngospasm and bronchial aspiration. Literature on anaesthetic management is limited. We present the case of a male patient with KD undergoing general anaesthesia (GA).

Case Report: A 69-year-old male, with prior KD diagnosis, presented with a suspected malignant vocal cord lesion. KD symptoms included facial weakness, limited mouth opening, dysarthria, dysphonia, choking episodes, self-limited laryngospasms and a need of a cervical collar for head support.

After multidisciplinary assessment, surgery under GA was planned. The patient fasted for >8 hours and received metoclopramide and atropine for premedication. Monitoring included basic parameters, TOF, and temperature. A rapid sequence induction was performed using fentanyl 1mcg/kg, propofol 2mg/kg, rocuronium 0.8 mg/kg, Sellick's manoeuvre and videolaryngoscopy. Maintenance was achieved with propofol and remifentanil.

The patient was extubated without complications when fully alert, after performing TOF-guided neuromuscular block reversal using sugammadex 4mg/kg and a period of CPAP.

Discussion: KD, an X-linked disorder that leads to neuromuscular toxicity, bulbar weakness (dysarthria, dysphagia), and impaired airway (AW) reflexes. Laryngospasms, glottic oedema, and aspiration risk make GA particularly challenging¹.

There is a potential for prolonged ventilation due to vulnerability to depressive drugs and muscle relaxants. Short-acting agents minimise respiratory depression, with depolarising (succinylcholine) and non-depolarising muscle relaxants being used, though succinylcholine may pose a hyperkalaemia risk².

Reversing neuromuscular block is crucial to prevent later respiratory depression, and extubation is preferred when the patient is awake.

References:

- Case series: anesthetic management of patients with spinal and bulbar muscular atrophy (Kennedy's disease). Canadian Journal of Anesthesia, 2009; 56:136–141.
- 2. Use of sugammadex in a patient with Kennedy's disease under general anesthesia. Saudi Journal of Anaesthesia, 2014; 8(3):418–420.

Learning Points:

- KD causes bulbar and spinal muscular weakness, impairing AW protective reflexes.
- GA poses high risks, requiring strategies for AW patency and to prevent postoperative respiratory depression.
- Literature on anaesthetic management of KD is limited; nondepolarising relaxants are preferred over succinylcholine.

11AP11-3

Pneumothorax after difficult face mask ventilation

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Background: Pneumothorax is a rare complication during anesthesia, mostly related to trauma, central venous cannulation or regional techniques.

Case Report: A 56 y-o woman was scheduled for knee replacement. She had a history of OSA, COPD and carried a ventriculoperitoneal shunt. The patient underwent an uneventful combined anesthesia (balanced general anesthesia + US-guided femoral nerve block). Intubation was done under Glidescope® vision, as she was a known Cormack III.

After extubation the patient suffered a severe laryngospasm and bronchospasm that required high pressure face-mask ventilation (FMV), during which profound hypotension supervened (MAP 45 mmHq).

The patient was reintubated and cardiovascular stability restored. She was transferred to the surgical ICU. A cardiac-US discarded pulmonary hypertension; chest x-ray and laboratory tests were unspecific, the former showing only subcutaneous emphysema. US-scan was not reliable because of subcutaneous adipose tissue.

Extubation was scheduled the same afternoon after which the patient had mildly desaturation. A new chest x-ray showed a complete pneumothorax. A chest tube was inserted and removed after 48 h. The patient was discharged home after 5 days.

Discussion: In our case the most probable cause of pneumothorax was difficult face-mask ventilation, as a result of air trapping and high airway pressure. During surgery driving pressure was <20 cmH2O, but FMV required very high pressure (>40 cmH2O) in an attempt to ensure oxygenation prior to reintubation. Before FMV it the patient was desaturated (SpO2 78%), but hypertensive (MAP >125 mmHg). Cardiovascular instability was probably due to sudden increase in intrathoracic pressure critically reducing preload. This case is special because the first X-ray showed only subcutaneous emphysema. Pneumothorax must have been minimal immediately after intubation but should have been increasing in size during mechanical ventilation.

References:

- 1. Hoechter DJ et al. Tension Pneumothorax During One-Lung Ventilation An Underestimated Complication? J Cardiothorac Vasc Anesth. 2018 Jun;32(3):1398-1402. doi: 10.1053/j. jvca.2017.07.022.
- 2. Markota A et al. Absence of lung sliding is not a reliable sign of pneumothorax in patients with high positive end-expiratory pressure. Am J Emerg Med. 2016 Oct;34(10):2034-2036. doi: 10.1016/j.ajem.2016.07.032.

Learning Points: An immediate chest X-ray does not rule out pneumothorax, but subcutaneous emphysema can be the only sign. Further investigations might be necessary.

11AP11-4

Evaluating nociception during general anaesthesia: a comparison of the Analgesia **Nociception Index and the Nociception Level** Index

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Background and Goal of Study: Multimodal anaesthesia combines hypnotics, analgesia, and, if necessary, muscle relaxation [1]. Potent opioids maintain the balance between nociception and analgesia, but over- as well as underdosing cause severe side effects. Optimal opioid titration is mainly based on the attending anaesthesiologist's knowledge. To help titrate analgesics and thus individualize analgesia several nociception monitors emerged. Two of these, the Analgesia Nociception Index (ANI) and the Nociception Level Index (NOL), focus on different autonomic reactions as surrogate parameters to estimate the nociception-antinociception balance.

Our primary objective was to compare the ANI and NOL during general anaesthesia to evaluate their (dis-)agreement level.

Materials and Methods: We included all patients with corresponding ANI and NOL recordings undergoing operations under general anaesthesia from a larger dataset. This included 30 patients (25 female, 5 male). Propofol and remifentanil were administered with a target-controlled infusion. Both monitors measure from 0 to 100. We allocated three ranges based on the manufacturer's information.

The ranges were

- i. Nociception, which is likely predominant,
- ii. Optimal analgesic level, and;

iii. Analgesia, which could be reduced as it exceeds nociception. Agreement and disagreement were evaluated across varying levels of remifentanil, propofol, and noxious stimuli. We performed a chi-square test of independence to assess any correlation between the monitors and the range allocated.

Results and Discussion: We analysed 38 hours and 15 minutes of surgery time. A predominance of analgesia was found 37.60% of the time for ANI and 38.99% for NOL, suggesting a potential opioid reduction. The optimal balance was observed in 30.89% for the ANI and in 30.85% for the NOL. A predominance of nociception occurred in nearly 25% for both monitors. The chi-square statistic was 31.79 (3, 55080), p < 0.001, Cramer's V: 0.024. ANI and NOL agreed 43.66% of the time. Disagreement by one score was found in 37.08%, and contrasting information was observed in 8.71%.

Conclusion(s): The overall agreement between ANI and NOL was less than 45%, while the opposite information was seen nearly 10% of the time. These findings demonstrate the need to evaluate nociception monitors to provide better nociception assessment during general anaesthesia.

Reference: DOI: 10.1213/ANE.0000000000003668

11AP11-6

Mask induction in pediatric patients with autism: is it really a winning strategy?

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Background and Goal of Study: Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that often presents with communication difficulties, sensory sensitivities, and behavioral challenges. The anesthetic management of pediatric patients with ASD undergoing surgery poses unique challenges.

This study aims to evaluate the complications and issues encountered in 18 pediatric patients with autism who underwent various surgical procedures under general anesthesia.

Materials and Methods: A survey analysis was conducted in 10 hospital centers on 23 pediatric patients diagnosed with ASD who were scheduled for surgery between 2019 and 2023. The surgeries included elective and emergency procedures across various specialties.

Data on anesthetic management, perioperative complications, and recovery were collected. Special attention was given to difficulties related to sedation, preoperative preparation, intraoperative management, and postoperative recovery.

Results and Discussion: The study identified several challenges, including difficulties in preoperative communication, with many patients exhibiting heightened anxiety and resistance to routine preparatory procedures.

During anesthesia induction, a significant proportion of patients (72%) required modified approaches, such as the use of alternative sedatives or physical restraint. Intraoperatively, 61% of the patients experienced increased sensitivity to stimuli, requiring adiustments to anesthetic depth.

Postoperatively, 44% of the patients showed signs of confusion or agitation, and 39% required prolonged recovery times due to difficulty with sensory overload or behavioral disturbances.

No severe adverse events were reported, but complications included nausea, delayed emergence, and difficulty in pain management.

Conclusion(s): Anesthesia in pediatric patients with ASD requires careful preoperative planning and individualized management strategies. Special attention to sensory sensitivities, anxiety management, and communication difficulties is essential to minimize perioperative complications.

The results suggest that a tailored approach to anesthetic care can help mitigate risks and improve patient outcomes in this challenging population. Further prospective studies are needed to refine protocols for this cohort.

Reference:

Morrow, L. E., & Lee, J. A. (2019). Challenges in anesthesia management for pediatric patients with autism spectrum disorders. Journal of Clinical Anesthesia, 58, 5-12.

11AP11-7 Predictive modeling of the anesthetic risk assessment score

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Background and Goal of Study: To improve patient safety from anesthesia events such as cardiac arrest or other adverse events during perioperative period, one should understand the causes or various risk factors contributing to those anesthesia adverse events (AAE).

We aim to develop the predictive model of the anesthesia risk assessment score, which has never been reported, in order to mitigate these risks and improve patient outcomes in noncardiac surgery.

Materials and Methods: This retrospective cohort study was conducted after approved by the Institutional Ethics Committee of Prince of Songkla University, Thailand, on July 24, 2023. The retrospective data was retrieved and reviewed between January and December 2022.

We recorded patient-related risk (age, sex, body mass index, underlying disease), anesthesia-related risk (ASA classification, choice of anesthesia, anesthetic agents), and surgery-related risk (duration of surgery, estimated blood loss).

Severity of anesthesia risk assessment score was divided into low (no adverse events), intermediate (score A-D), and high-risk assessment score (score E up). Risk scores of score E up (vs. A-D), adjusted odds ratios (OR), and 95% confidence intervals (CI) were determined. The risk scores were derived from the coefficients of the final multivariate logistic regression model.

Results and Discussion: The incidence of anesthesia incidents (A to D) and AAE (E to I) was 6.2% (n=243) and 59.9% (n=2,353), respectively, among the 3,930 patients. Our risk prediction tool for AAE provided a sensitivity of 64% and a specificity of 69% and was classified into high (>15), intermediate (11–15), or low (<11) risk groups (the area under the curve of 0.74, Fig 1).

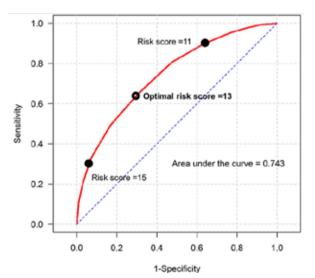


Fig 1.

The patient-related risks were age 10-65 years and >65 years (vs. age <10 years) (OR [95% CI]: 1.9 [1.4, 2.5], score of 2, and 2.9 [2.1, 4.1], score of 3, respectively) and use of preoperative antiar-

rhythmic drugs (2.7 [1.1, 7.0], score of 3). The anesthesia-related risk was ASA classification 3 and 4 (vs. 1) (2.2 [1.5, 3.3], score of 2, and 5.5 [2.4, 12.8], score of 4, respectively), general anesthesia (GA) alone and GA with regional anesthesia (vs. monitor anesthetic care) (7.8 [3.7, 16.6], score of 5, and 6.7 [3.2, 14.5], score of 4, respectively), and etomidate use (2.1 [1.2, 3.8], score of 2). The surgery-related risk was emergency surgery (1.5 [1.1, 2.0], score of 1), duration of surgery 3-4 h and >4 h (vs. <1 h) (2.8 [2.1, 3.8], score of 3, and 5.9 [4.3, 8.0], score of 4, respectively) and estimated blood loss >1000 ml (vs. 100 ml) (3.0 [1.7, 5.3], score of 3). Conclusion(s): Our risk prediction tool for AAE provided a modest predictive ability. The combination of patient-related and anesthesia-related risk factors played an important role in the intermediate to high-risk group of AAE. The modifiable risk factors were ASA classification and choice of anesthesia, which could minimize the risk of AAE.

11AP11-8

When reversal fails: investigating recurarization after sugammadex administration

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Background: Sugammadex, a modified γ-cyclodextrin, has transformed clinical practice by providing rapid and reliable reversal of neuromuscular blockade (NMB) induced by rocuronium and vecuronium, even at profound levels. Unlike acetylcholinesterase inhibitors, Sugammadex reverses NMB without muscarinic side effects. However, cases of recurarization or delayed recovery have been reported. We present a case of recurarization following Sugammadex administration.

Case Report: A 60-year-old female with ovarian cancer underwent laparoscopic hysterectomy and bilateral salpingo-oophorectomy under general anesthesia. Her history included breast neoplasia, fibromyalgia, and smoking. Induction was achieved with fentanyl (2 mcg/kg), lidocaine (1 mg/kg), propofol (2 mg/kg), and rocuronium (0.6 mg/kg). Intraoperative medications included dexamethasone, ondansetron, ketorolac, paracetamol, and metamizole. NMB was monitored using Train-of-Four (ToF) acceleromyography (Dräger ToFscan®), calibrated per instructions. The surgery lasted two hours. At its conclusion, ToF=1. Sugammadex (400 mg) was administered, achieving ToF=4 in six minutes (CONOX®=80). Recurarization occurred after 10 minutes. Anesthetic depth was increased, and 200 mg of Sugammadex was given. ToF=4 returned after 15 minutes, but spontaneous ventilation was absent. At 20 minutes, recurarization recurred, requiring 200 mg Sugammadex. Ventilation resumed at 25–30 minutes, with complete reversal. The patient was extubated 40 minutes post-reversal and monitored without complications.

Discussion: Possible causes of recurarization include monitoring errors, drug batch defects, hypothermia, neuromuscular pathology, organ dysfunction, pharmacological interactions, immune resistance, rocuronium redistribution, or acute-phase protein binding. In this case, the etiology was likely multifactorial, involving pharmacological interactions, immune resistance, and redistribution. Other causes were systematically ruled out. To minimize recurarization risks, clinicians should ensure rigorous monitoring, individualized dosing, drug quality assessment, and extended observation.

Reference:

Iwasaki, H., Renew, J.R., Kunisawa, T. Preparing for the unexpected: special considerations and complications after sugammadex administration. BMC Anesthesiology. 2017; 17, 140. **Learning points:** Recurarization is a rare serious complication; Importance of Quantitative NMB Monitoring; Clinical preparedness for reversal failure is vital.

11AP11-9

Impact of robotic-assisted colorectal surgery on intraoperative and postoperative pain: a retrospective comparison with conventional laparoscopic surgery

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Background and Goal of Study: The benefits of robot-assisted colorectal surgery compared to conventional laparoscopic surgery remain controversial. There is limited evidence on its effect on perioperative analgesia. The aim of this study is to assess whether robotic surgery is associated with less intraoperative and postoperative pain.

Materials and Methods: After approval by the ethics committee, a retrospective study was designed for patients undergoing elective colorectal surgery in 2022. Patients were divided into 2 groups based on the type of surgical approach: robotic versus conventional laparoscopic. In terms of intraoperative analgesia, all patients were managed with multimodal anesthesia, incluiding lidocaine (2 mg/kg bolus + infusion at 1.5 mg/kg/h), ketamine (0.5 mg/kg after induction), magnesium sulfate (10 mg/kg/h), dexmedetomidine (0.3 µg/kg/h) and fentanyl (on demand according to hemodynamics). Postoperatively, they received paracetamol 1 g/6h and dexketoprofen 50 mg/8h. Demographic variables (sex, age, BMI, ASA) as well as the type (right hemicolectomy, sigmoidectomy, or low anterior rectal resection) and duration of surgery were collected. The outcomes evaluated were intraoperative pain (measured by fentanyl consumption in µg/kg/h) and postoperative pain (measured by the percentage of patients with any VAS>3 or VAS>7 during the first 48 hours post-surgery).

Statistical analysis: Student's t-test for quantitative variables (intraoperative fentanyl consumption) and chi-square for qualitative variables (% of patients with VAS>3 or VAS>7).

Results and Discussion: Seventy-two patients were included (robot group= 41, laparoscopic group= 31). There were no differences between the groups in terms of demographic variables or type of surgery. Surgery duration (mean±SD) was longer in the robot group (273±83 vs. 234±60 minutes, p<0.05). Intraoperative fentanyl consumption was significantly higher in the laparoscopic group compared to the robot group (1.43±0.67 μ g/kg/h vs. 1.13±0.53 μ g/kg/h; p<0.05). In the laparoscopic group, 52% of patients had a VAS > 3 (moderate pain) postoperatively compared to 15% in the robot group (p<0.05). In the laparoscopic group, 9.5% of patients had a VAS>7 (severe pain) postoperatively compared to 2.5% in the robot group (p=0.18).

Conclusion: Although robotic surgery has a longer duration, it requires fewer opioids to maintain adequate intraoperative analgesia. Robotic surgery provides better pain control during the first 48 hours postoperatively.

11AP11-10

Unraveling negative pressure pulmonary edema post-tonsillectomy

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Background: Negative pressure pulmonary edema (NPPE) is a rare but serious postoperative complication caused by upper airway obstruction, often following head and neck surgeries. Its rapid onset and nonspecific symptoms, such as hypoxemia and respiratory distress, makes early recognition crucial. We report a case of NPPE following a tonsillectomy in a healthy young male patient.

Case Report: A 29-year-old male underwent an uncomplicated tonsillectomy under general anesthesia with orotracheal intubation. Rocuronium was used for neuromuscular blockade and reversed with sugammadex 200mg before extubation with train-of-four monitoring.

He was transferred to the post anesthesia care unit (PACU) on spontaneous ventilation, and 5 minutes later developed agitation, dyspnea, and oxygen desaturation to 88%. There was no airway active bleeding. Arterial blood gas showed normal pH and pCO2 but a low pO2 of 58 mmHg. Examination revealed tachycardia (122 bpm), normal blood pressure, and bilateral coarse crackles and rales.

Oxygen via nasal cannula at 2L/min improved saturation to 96%. Chest X-ray (CXR) and Computed Tomography (CT) confirmed bilateral alveolar infiltrates, and a diagnosis of NPPE was considered. He was monitored for 18 hours in the PACU with progressive symptom resolution.

Oxygen was discontinued after 12 hours, and he remained asymptomatic, eupneic, with normal lung auscultation and normoxic at discharge with no further complications.

Discussion: NPPE is a rare complication of airway obstruction, caused by negative intrathoracic pressure leading to fluid transudation into the lungs and acute hypoxemia. It typically occurs after extubation or airway manipulation. Early diagnosis using imaging, such as CRX or CT, is essential. NPPE is often self-limiting and managed with supportive care, including oxygen and monitoring. Awareness is vital, particularly after surgeries like tonsillectomy, to avoid unnecessary interventions.

Reference:

Yun H, Jeong S, Lee J, et al. "Negative pressure pulmonary edema following extubation: a review of pathophysiology, diagnosis, and management." Korean Journal of Anesthesiology. 2020;73(5):373-381.

Learning Points:

- 1. NPPE is a rare but critical cause of postoperative respiratory distress, often after airway manipulation.
- 2. Early identification, oxygen supplementation, and monitoring are crucial.
- 3. Consider NPPE when bilateral infiltrates appear without infection, aspiration or signs of heart failure.

11AP11-11

Comparison of ramosetron with different doses on hemodynamic influences during total intravenous anesthesia induction with propofol and remifentanil and endotracheal intubation

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Background and Goal of Study: Serotonin (5-hydroxytryptamine; 5-HT) induces the triphasic blood pressure response consisting of early short-term hypotension, a middle pressor phase, and longer-lasting hypotension. Ramosetron, 5-HT3 antagonists, effectively reduced the vasopressor demand for the prevention or treatment of spinal anesthesia-related hypotension.

Therefore, we investigated whether the ramosetron affects the hemodynamic changes during anesthesia induction under total intravenous anesthesia with propofol and remifentanil.

Materials and Methods: This study was approved by the Institutional Review Board, and was prospectively registered with the Clinical Research Information Service.

After obtaining the patient's informed consent, 135 patients aged 20 to 70 years with an ASA Physical Status of I-III were randomly assigned to three groups receiving normal saline (group C, n=43), ramosetron 0.3 mg (group R3, n=49) or ramosetron 0.6 mg (group R6, n=43) once 5 minutes before anesthesia induction.

Anesthesia induction was initiated with 6 mg/kg/h of propofol and 60 μ g/kg/h of remifentanil after a bolus dose of propofol 1 mg/kg. We recorded hemodynamics [systolic arterial pressure (SAP), diastolic arterial pressure (DAP), mean arterial pressure (MAP), and heart rate (HR)], before injecting either ramosetron or normal saline, at loss of consciousness, at 1 min after rocuronium injection, before endotracheal intubation, and 1 min after endotracheal intubation.

We analyzed data using the one-way analysis of variance (ANO-VA) and repeated measures ANOVA, appropriately. p values < 0.05 were considered statistically significant.

Results and Discussion: No significant differences in SAP, DAP, MAP, and HR were observed among the groups. The differences in hemodynamics value from baseline were lesser in group R6 than in groups C and R3 during anesthesia induction and after endotracheal intubation (without significant differences).

Conclusion(s): Ramosetron in the clinical dose range has no significant effect on hemodynamic changes after anesthesia induction and endotracheal intubation. A high dose of ramosetron can be expected to reduce the degree of blood pressure drop that occurs during anesthesia induction and endotracheal intubation.

However, further studies are needed on whether a high dose of ramosetron can satisfy the effectiveness of preventing PONV or drug injection pain simultaneously without clinically significant side effects.

11AP11-12

The effect of arthroscopic shoulder surgery on lung, assessed by ultrasonography, in the elderly patients under general anesthesia with mechanical ventilation

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Background and Goal of Study: The study was designed to compare the lung condition, assessed by lung ultrasonography (LUS), after arthroscopic shoulder surgery (ASS) between surgical side and non-surgical side in the elderly patients under general anesthesia with mechanical ventilation.

Materials and Methods: Elderly patients above 65 years old undergoing ASS under general anesthesia with mechanical ventilation were enrolled in the study. Lung condition was assessed by LUS before and after ASS. Intra- and post-operative respiratory events were also evaluated. Chest radiograph was performed twice, just after discharge from post-anesthetic care unit (PACU) and before admission at general ward and on postoperative 2 days.

Results and Discussion: Surgical side significantly had the higher values for the scores of LUS (sitting position at end of ASS, 1.44 \pm 1.87 in surgical side vs. 0.43 \pm 0.75 in non-surgical side, p < 0.001; supine position just before discharge from PACU, 1.48 \pm 1.91 in surgical side vs. 0.43 \pm 0.75 in non-surgical side, p < 0.001). There were no intra-operative respiratory events, including desaturation, and post-operative respiratory events until post-operative 2 days. Any abnormal finding was not observed on twice chest radiograph in all patients.

Conclusion(s): ASS for the elderly patients under general anesthesia with mechanical ventilation had the limited impact on respiratory function, although the significant change of lung condition at surgical side, assessed by LUS, was observed.

Additionally, LUS than chest radiograph showed the better detection of lung change after ASS.

Regional Anaesthesia

12AP01-2

A comparative study of Quadratus Lumborum block vs epidural block for post operative analgesia in patients with gynaecological malignancies

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Background and Goal of Study: Epidural analgesia (EA) is associated with side effects like hypotension and motor block . The effect of a single shot Quadratus lumborum block (QLB) has been found to last for up to 24 to 48 hours. We conducted a randomised controlled study to compare QLB vs EA for postoperative analgesia.

Materials and Methods: After obtaining written informed consent , 52 patients (18-75 years, ASA I/II) scheduled for gynecological onco-surgeries were randomly allocated to receive either lumbar EA (0.1% of Ropivacaine with fentanyl 2mcg/ml: 5 cc bolus + 5cc/ hour for 48 hours) or bilateral USG-guided transmuscular QLB (25ml of 0.2% ropivacaine on each side). Patients with decreased mental ability, BMI > 30kg/m2 or surgeries involving removal of non-gynecological viscera were excluded from the trial. Postoperative analgesia was provided with paracetamol, ketorolac and i/v PCA morphine. The primary objective was to compare postoperative morphine consumption at 24 hours. The secondary objectives were comparison of morphine consumption and NRS (numeric rating scale) scores at 2, 6, 12,24 and 48hours and time to first mobilization). Data was analyzed using SPSS software (Mann Whitney-U/T-test).

Results and Discussion: Morphine consumption was comparable in two groups at 24 hours [1.5 mg (0.5,4.6) in EA vs 2.5 mg (1,4.37) in QLB, p= 0.55]. 12-hour NRS score was lower in epidural group as compared to QLB group [1.0 (1,2)] vs 2.5 (2 - 3), p= 0.05). NRS scores, morphine consumption at all other time points and time to mobilization was comparable between the two groups (table 1).

	EA	QLB	P value
NRS (median, IQR)			
2h	1.0 (1,2)	1.0 (1,2)	0.10
6h	1.0 (0.75,2)	2.0 (1,2.75)	0.10
12h	1.0 (1,2)	2.5 (2,3)	0.05
24h	1.0 (1,2)	2.0 (2,3)	0.65
48h	1.0 (0,1)	1.0 (0,1)	0.40
PCA Morphine consumption (mg) (median, IQR)			
2h	0.5 (0,1)	0 (0,1)	0.71
6h	1.0 (0,2)	1.0 (0.5,1.87)	0.59
12h	1.25 (0.37, 3.12)	1.5 (0.5,2.87)	0.51
24h	1.5 (0.5,4.62)	2.5 (1,4.37)	0.56
48h	2.0 (0.5, 5.62)	3.25 (1,4.37)	0.65
Day of mobilization (mean, SD)	1.19 (0.42)	1.13 (0.34)	0.56

Conclusion: There was no difference between QLB and EA when used for postoperative analgesia in patients with gynecological cancers.

12AP01-3

Comparison of analgesic effects between modified thoracoabdominal nerve block and oblique subcostal transversus abdominis plane block in laparoscopic cholecystectomy: a retrospective study

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Background and Goal of Study: Laparoscopic cholecystectomy (LC) causes significant postoperative pain. Oblique subcostal transversus abdominis plane block (OSTAPB) and the modified thoracoabdominal nerve block through the perichondral approach (M-TAPA) are both trunk blocks used for postoperative

This study compared the analgesic effect of M-TAPA with that of OSTAPB in patients undergoing LC, hypothesizing that M-TAPA would provide superior analgesia.

Materials and Methods: Medical records of 125 patients who underwent LC from 2022 to 2024 were retrospectively analyzed. The primary outcome was the number of analgesic requirements in the first 15 hours postoperatively. All LCs were performed with ports positioned in the right upper quadrant.

Both OSTAPB and M-TAPA groups received blocks in the right abdomen and rectus abdominis sheath block to the umbilical region. The OSTAPB group received an oblique subcostal block in the right transversus abdominis fascial plane.

The M-TAPA group received a modified thoracoabdominal nerve block through a perichondral approach centered over the costal cartilage of ribs 7-9 on the right side. Propensity score matching using genetic matching with replacement and generalized linear model distance estimation was performed to adjust for confounding factors.

Confounding factors included in the propensity score model were age, gender, body mass index (BMI), intraoperative fentanyl dose, administration of flurbiprofen or acetaminophen, type of anesthesia (inhalation versus intravenous), and operative time. Robust standard errors were used for effect estimation due to matching with replacement.

Results and Discussion: 49 patients received M-TAPA and 76 patients received OSTAPB. Propensity score matching showed that 15 M-TAPA patients were matched with 76 OSTAPB patients. In the matched groups, patients received 0-4 rescue doses.

There was no statistically significant difference in the number of analgesics (mean difference: -0.16, 95% confidence interval: -0.52 to 0.21, p = 0.41).

A limitation of this study is that the asymmetrical matching may limit generalizability, necessitating cautious interpretation of re-

Conclusion: There was no significant difference in analgesic effect between the two techniques. These results suggest that both methods of blockade are viable options for pain management in LC.

12AP01-4 BRILMA block for breast oncological surgery

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Background: The choice of anesthetic plan is critical, especially in balancing safety and efficacy for high-risk patients. The BRILMA block provides anesthesia to the thoracic and mammary region by infusing local anesthetic between the serratus anterior and external intercostal muscles under ultrasound (US) guidance. One of its key uses is in oncological breast surgery, where it minimizes systemic impact and improves outcomes.

This case shows how locoregional techniques can allow non-delayable surgeries in frail patients while maintaining safety¹

Case Report: A 64-year-old man was scheduled for a right mastectomy and selective sentinel node biopsy following a breast cancer diagnosis. He had multiple comorbidities, including permanent atrial fibrillation, chronic heart and renal failure, and severe aortic stenosis with moderate regurgitation.

During preanesthetic evaluation, prioritization was initially given to valve correction, but valvuloplasty proved ineffective. Due to his ongoing valvular disease, the surgical plan was adapted to a right breast lumpectomy and sentinel node biopsy.

Anesthesia was provided through a right BRILMA block under US guidance, combined with midazolam and fentanyl sedation. Mepivacaine and bupivacaine were used for the block, with additional lidocaine infiltration at the surgical site.

The patient remained hemodynamically stable throughout the procedure, with no complications. Postoperative pain was controlled with standard intravenous analgesia. He was discharged the following day.

Discussion: The BRILMA block was an effective alternative in this high-risk patient, unsuitable for general anesthesia due to his severe comorbidities. It allowed for stable hemodynamics, especially relevant in the context of severe valvular disease, while minimizing the risk of decompensation.

The block provided effective pain control and reduced the need for systemic sedatives and analgesics. It optimized postoperative recovery time, hospital stay, patient experience, admission cost and resources.

References:

1. Chin KJ et al. Ultrasound-guided fascial plane blocks of the chest wall: a state-of-the-art review.

Learning Points: Locoregional anesthesia is an invaluable tool for patients with complex comorbidities, which are increasingly prevalent in the surgical population.

Its use requires a thorough preoperative assessment, close interdisciplinary collaboration, and careful consideration of the risks and benefits to optimize patient outcomes.

12AP01-5

Heart rate variability and analgesia effect of transversus abdominis plane block in laparoscopic surgery patients

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Background and Goal of Study: Monitoring pain and analgesic balance is critical in clinical anesthesia. Traditionally, indirect brainstem reflex signs such as heart rate (HR) and blood pressure (BP) were used to assess pain stimuli. In recent years, modern techniques have applied objective parameters. Heart rate variability (HRV), a measure of autonomic nervous system activity, is closely associated with the balance of analgesia and nociception in anesthetized patients.

However, Common HRV-based commercial tools, such as the analgesia nociception index (ANI), have not effectively demonstrated significant improvements in postoperative pain, resulting in inconsistent outcomes in clinical practice.

Further investigation is warranted to understand the objectivity of HRV in monitoring pain and its underlying physiological significance.

Materials and Methods: 75 patients undergoing laparoscopic surgery at Taitung MacKay Memorial Hospital (August 2020–April 2023) were randomly assigned to general anesthesia group or general anesthesia combining transversus abdominis plane (TAP) block group.

Physiological signals, including electrocardiograms, were continuously recorded. Statistical analyses, including repeated measurement ANOVA and logistic regression, evaluated changes in HRV and its predictive value for postoperative pain.

Results and Discussion: Records showed significant hemodynamic changes during incision and insufflation, with increased BP and HR. TAP block influenced baseline HRV and its trends during surgery.

However, most HRV parameters and even the performance of the TAP block showed no correlation with postoperative pain scores, except for high-frequency (HF).

Conclusion(s): HRV analysis indicated sympathetic activation and parasympathetic suppression during noxious stimulation in laparoscopic surgery, with different HRV parameters trend in two groups.

HF before and after incision emerged as the only predictor of postoperative pain, suggesting a potential link between HF and pain thresholds under general anesthesia, as well as the important role of the parasympathetic nervous system in postoperative pain modulation.

The lack of significant correlations between HF after pneumoperitoneum inflation or TAP block and postoperative pain may be attributable to variability in perioperative analgesic dosing, the exclusion of somatic nerve blockade, and the heterogeneous effects of regional nerve block.

12AP01-6

Clavipectoral fascial plane block-Novel anesthesia techniques for clavicle surgery. Method of choice

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Background: Clavicle fracture is a common injury in adults and mostly requires surgical treatment for optimal recovery. To achieve the best results it is necessary to provide adequate intra and postoperative analgesia. Currently, various combinations of regional anesthesia are used, as well as sole techniques.

One of the novel techniques of regional anesthesia is the Clavipectoral plane block (CPB), which provides targeted anesthesia of supraclavicular nerve branches, with less systemic complications compared with interscalene and supraclavicular brachial plexus blocks. The CPB can be used as a sole technique, in combination with intravenous anesthesia or light sedation, due to sufficient analgesia.

Case Report: A 65-year-old male with grade 2 arterial hypertension, abdominal obesity and history of smoking had a closed, displaced clavicle fracture as a result of a fall. After premedication with 3 mg of Midazolam intravenously, the fracture line was visualized with linear ultrasound probe and solution of 0.5% 16 ml Bupivacaine with 4 mg Dexamethasone was injected 2 cm distally and proximally to the fracture line.

Sedation with Propofol 150 mg/hour was initiated after regional anesthesia. There was no response or sympathetic activation to the surgical stimulation. The patient's hemodynamics remained stable, the breathing was spontaneous.

Postoperative pain in first 12 hours was 0/10. 75 mg of Diclofenac was administered for postoperative analgesia after 12 h. The patient was discharged the day after the surgery.

Discussion: Several case reports have already been published to support the use of brachial plexus block (interscalene approach) or combinated blocks (interscalene with superficial cervical plexus) in clavicle surgeries.

However, these techniques can be time-consuming as two separate ultrasound-guided injections are needed to provide the surgical block. The CPB can avoid the possible adverse events, such as ipsilateral phrenic nerve palsy, vocal cord paralysis, vertebralartery injection, total spinal anesthesia, pneumothorax.

CPB can be the method of choice for clavicle surgeries, since it provides sufficient analgesia, doesn't cause motor block, can be used without general anesthesia, systemic complications are less common, and technically easy to use.

Reference:

Qin M, Zhao S, Guo W, Tang L. Open reduction and plate fixation compared with non-surgical treatment for displaced midshaft clavicle fracture: Medicine (Baltimore) 2019; 98: e15638

12AP01-7

Dexamethasone vs. Dexmedetomidine as a perineural adjuvant to Erector Spinae Plane Block for idiopathic scoliosis surgery: a randomized, double-blinded clinical trial

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Background and Goal of Study: The Erector Spinae Plane Block (ESPB) is recognized for its adequate postoperative analgesia in scoliosis surgery.

This study evaluated and compared the analgesic efficacy of dexamethasone and dexmedetomidine as perineural adjuvants to ESPB in pediatric idiopathic scoliosis surgery.

Materials and Methods: Ninety pediatric patients (ages 10-18, ASA PS I-III) were randomized into three groups: Control (0.2% ropivacaine), DEX (0.2% ropivacaine + 0.1 mg/kg dexamethasone), and DEM (0.2% ropivacaine + 0.1 µg/kg dexmedetomidine). Primary outcome: time to first rescue opioid analgesia.

Secondary outcomes included total opioid consumption, pain scores, inflammatory markers (NLR, PLR), MEP changes, and adverse effects (p<0.05).

Results: The DEX and DEM groups had significantly prolonged times to first rescue analgesia (12.96 \pm 2.03 h and 11.65 \pm 2.95 h, respectively) compared to the control (5.15 \pm 1.69 h; p<0.0001). Total opioid consumption was lower in the DEX and DEM groups (p<0.0001).

Pain scores (NRS) were reduced at various postoperative time points in both groups, with no significant differences between DEX and DEM. No significant differences were found in NLR. PLR. or blood glucose levels (Table 1).

The DEM group had 11 cases of bradycardia and 5 of hypotension. No nerve injuries were reported. The DEX group showed improved MEP amplitudes (Table 2).

		Control	DEX	DEM	р	p DEX to Control	p DEM to Control	p DEX to DEM
Time to first rescue opioid analgesia (hours)		5.15 ±1.69	12.96 ±2.03	11.65 ±2.95	<0.0001	<0.0001	<0.0001	0.3975
Total opioid consumption (intravenous morphine equivalents; mg/kg)		3.06 ±0.84	2.12 ±0.42	2.13 ±0.31	<0.0001	<0.0001	<0.0001	>0.9999
	4 h	1.97 ±0.56	1.70 ±0.47	1.73 ±0.45	0.1140			
	8 h	2.13 ±0.63	1.67 ±0.48	1.70 ±0.47	0.0034	0.0072	0.0157	>0.9999
NRS	12 h	2.23 ±0.68	1.57 ±0.50	1.50 ±0.51	<0.0001	0.0006	0.0001	>0.9999
	16 h	2.33 ±0.55	1.57 ±0.50	1.60 ±0.50	<0.0001	<0.0001	<0.0001	>0.9999
	20 h	2.03 ±0.56	1.77 ±0.50	1.97 ±0.56	0.1483			
	24 h	2.20 ±0.55	1.80 ±0.55	2.03 ±0.61	0.0309	0.0260	0.8241	0.3760

Table 1. Primary and secondary outcomes. Values are means.

The DEX group showed enhanced MEP amplitudes during surgery, suggesting a beneficial effect on neuromonitoring, as seen in Table 2.

Patients groups Examined parameters	Control	DEX	DEM	Control vs. DEX	p Control vs. DEM	DEX vs. DEM
Mean TES stimulus strength (mA)	95.1 ± 9.4	91.6 ± 8.2	94.2 ± 7.9	0.04	0.06	0.05
Mean MEP amplitude (μV) T0	410.4 ± 55.4	409.3 ± 51.2	412.3 ± 52.1	0.08	0.07	0.06
Mean MEP amplitude (μV) T1	680.3 ± 43.8	820.4 ± 43.8	668.2 ± 41.4	0.04	0.06	0.04
p T0 vs. T1	0.04	0.02	0.04	NA	NA	NA
Mean MEP latency (ms) T0	31.9 ± 2.2	32.0 ± 1.9	31.5 ± 2.0	0.07	0.09	0.06
Mean MEP latency (ms) T1	30.5 ± 2.6	31.4 ± 2.2	30.5 ± 2.3	0.06	0.08	0.06
p T0 vs. T1	0.05	0.05	0.05	NA	NA	NA

Table 2. Changes in cumulative anesthesia, transcranial electrical stimulation, and motor-evoked potential parameters were recorded from the tibialis anterior muscle before and after the surgical correction procedures.

Conclusion: Dexamethasone and dexmedetomidine as ESPB adiuvants effectively prolonged analgesia and reduced opioid use in pediatric scoliosis surgery, with dexmedetomidine associated with more hemodynamic effects. These findings support optimizing analgesia and neuromonitoring strategies in pediatric spinal surgeries.

12AP01-8

Efficacy of erector spinae plane block versus caudal block on postoperative analgesia in children undergoing surgery: a systemic review and meta-analysis

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Background and Goal of Study: Regional anesthesia is part of multi-modal analgesia in pediatric surgery for effective pain relief. Traditional techniques like the Caudal Block (CB) and, more recently, facial plane blocks like the Erector Spinae Plane Block (ESPB) have gained popularity.

This systematic review and meta-analysis compare CB and ESPB in pediatric lower abdominal and limb surgeries. It aims to clarify mixed outcomes from recent trials regarding the effectiveness of both techniques.

Materials and Methods: This review, registered with the International Prospective Register of Systematic Reviews (ID: CRD 42024533579), includes eight randomized controlled trials comparing postoperative analgesia between the erector spinae plane block and caudal epidural block in pediatric lower abdominal and limb surgeries.

The meta-analysis assessed the proportion of patients requiring rescue analgesia and postoperative pain intensity.

Results and Discussion: Among the 58 articles screened, 8 RCTs (575 patients) were finally included in the systematic review. Among them, a meta-analysis of four RCTs (217 patients) concluded a significant decline in the proportion of patients requiring rescue analgesia in the ESPB group compared to the CB group [OR = 0.55 (95% CI: 0.31, 0.96), p<0.05].

Also, analysis of six RCTs (360 patients) concluded a significant decline in pain intensity revealed by the fixed-effects model using standardized mean difference (SMD = -0.29, 95% CI: -0.51, -0.06: p < 0.05) and a significant difference was identified between ESBP and CB groups.

Conclusion(s): We conclude that ESPB provides better postoperative analgesia than CB in children undergoing lower abdominal and lower limb surgeries. ESPB reduces postoperative pain intensity scores and analgesic requirements compared to CB.

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- 2. Elshazly M, Shaban A, Gouda N, Rashad M, Soaida SM. Ultrasound-guided lumbar erector spinae plane block versus caudal block for postoperative analgesia in pediatric hip and proximal femur surgery: A randomized controlled study. Korean J Anesthesiol. 2023;76(3):194-202.
- 3. Luo R, Tong X, Yan W, Liu H, Yang L, Zuo Y. Effects of erector spinae plane block on postoperative pain in children undergoing surgery: A systematic review and meta-analysis of randomized controlled trials. Paediatr Anaesth. 2021;31(10):1046-55.

12AP01-9

iPACK block with Adductor Canal Block vs. Lumbar Erector Spinae Plane Block (L-ESPB) in Total Knee Arthroplasty: a randomized, double-blinded, controlled trial

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Background and Goal of Study: Total Knee Arthroplasty (TKA) is associated with significant postoperative pain, often requiring substantial opioid use. This study compared the analgesic efficacy of a single-injection L2 erector spinae plane block (L2-ESPB) versus an ultrasound-guided iPACK block combined with an adductor canal block (ACB) in patients undergoing TKA under spinal anesthesia.

Material and Methods: Following IRB approval and informed consent, ninety patients (ages 65-89, ASA I-III) scheduled for TKA were randomized to receive iPACK+ACB (0.2% ropivacaine, 20 ml + 10 ml), L2-ESPB (0.2% ropivacaine, 20 ml on each side), or no block (control).

In the pre-anesthesia room, all patients received continuous monitoring, supplemental oxygen, and midazolam 7.5 mg p.o. as part of a multimodal analgesia protocol.

Spinal anesthesia (L3/4) was administered with 4 ml of 0.5% ropivacaine under mild sedation using propofol (5 mg/kg/h), with spontaneous ventilation maintained via an oxygen mask.

Ultrasound-guided blocks were performed by two experienced anesthesiologists, with no periarticular infiltration during surgery. The primary outcome was total opioid consumption within 48 hours postoperatively.

Secondary outcomes included pain scores, time to first rescue opioid analgesia, quadriceps strength, and inflammatory markers (NLR and PLR).

Results and Discussion: The iPACK+ACB group demonstrated significantly lower total opioid consumption (3.0±3.3 mg) compared to both the L2-ESPB (6.8±3.8 mg; p=0.0442) and control groups (18.2±4.0 mg; p<0.0001).

The time to first rescue opioid was longest in the iPACK+ACB group (12.0±1.9 h) versus the L2-ESPB group (9.2±1.9 h; p<0.0001) and control (4.3±1.1 h; p<0.0001). Both the iPACK+ACB and L2-ESPB groups exhibited lower pain scores and NLR and PLR levels across all time points compared to the control group.

The parametric distribution of numerical variables was evaluated using the Shapiro-Wilk normality test. The ANOVA or Kruskal-Wallis test with post hoc Tukey's or Dunn's test assessed group differences.

Categorical variables were compared with the Kruskal-Wallis test, and an analysis of contingency was compared with Fisher's exact test. A p-value <0.05 was considered statistically significant.

	Control group (n-30)	iPACK+ACB group (n=30)	group (n=30)	p all three groups	group to the		p iPACK+ACB group to the L-ESPB group
Total Opioid Consumption in 48h (morphine mEQ)	18.2 (4.0)	3.0 (3.3)	6.8 (3.8)	<0.0001	<0.0001	0.0442	<0.0001
Time to first rescue opioid analgesia (hours)	4.3 (1.1)	12.0 (1.9)	9.2 (1.9)	<0.0001	<0.0001	<0.0001	<0.0001
Postoperative opioid consumption							
yes no	30 0	16 14	26 4	<0.0001	<0.0001	0.1124	0.0101
NRS							
4h 8h 12h 16h 20h 24h	4.3 (1.1) 4.0 (0.7) 3.2 (0.7) 3.0 (0.7) 2.7 (0.6) 2.1 (0.7)	2.8 (0.7) 2.1 (0.7) 2.1 (0.8) 1.7 (0.6) 1.7 (0.6) 1.6 (1.4)	2.0 (0.6) 1.9 (0.6) 1.6 (0.5) 2.2 (0.6) 1.8 (0.6) 1.4 (1.8)	<0.0001 <0.0001 <0.0001 <0.0001 <0.0001 0.0017	<0.0001 <0.0001 <0.0001 <0.0001 <0.0001 0.0090	<0.0001 <0.0001 <0.0001 0.0005 <0.0001 0.0041	0.0009 0.8732 0.0988 0.0844 >0.9999 >0.9999
NLR							
before surgery 24h 48h	2.0 (0.6) 3.5 (0.8) 2.8 (0.6)	1.8 (0.7) 3.5 (0.7) 2.9 (0.5)	1.9 (0.7) 4.0 (0.8) 3.1 (0.6)	0.4878 0.0781 0.1166			
PLR							
before surgery	175.1 (41.4)	156.8 (38.0)	177.3 (46.0)	0.1229			
24h	304.4 (78.0)	301.4 (79.5)	333.9 (52.0)	0.2527			
48h	245.0 (63.5)	238.7 (65.0)	268.2 (66.6)	0.2506			
Quadriceps muscle strength	Э						
Knee extension 3h 6h 12h 24h	3.3 (0.7) 3.6 (0.5) 4.0 (0.5) 4.3 (0.4)	3.1 (0.6) 3.6 (0.5) 4.0 (0.4) 4.3 (0.5)	3.4 (0.7) 3.6 (0.5) 4.1 (0.4) 4.3 (0.5)	0.1030 0.8717 0.4674 0.8146			
Hip adduction 3h 6h 12h 24h	3.4 (0.5) 3.6 (0.5) 4.0 (0.4) 4.4 (0.5)	3.6 (0.5) 3.8 (0.4) 4.2 (0.5) 4.3 (0.5)	3.6 (0.5) 3.8 (0.4) 4.3 (0.4) 4.4 (0.5)	0.0795 0.1003 0.0619 0.9532			

Conclusion(s): The iPACK+ACB block provided superior pain relief and reduced opioid consumption compared to L2-ESPB following TKA.

Both the iPACK+ACB and L2-ESPB reduced pain and extended the time to first opioid analgesia, though no differences in NLR or PLR levels were found between groups.

These findings suggest iPACK+ACB as a promising approach for enhanced analgesia in TKA.

12AP01-10

Erector Spinae Plane Block (ESPB) vs. Periarticular Nerve Group Block in total hip arthroplasty in elderly patients: a randomized, double-blinded, controlled trial

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Background and Goal of Study: Total Hip Arthroplasty (THA) in elderly patients can result in significant postoperative pain. This study assessed and compared the analgesic efficacy of ultrasound-guided Erector Spinae Plane Block (ESPB) versus Pericapsular Nerve Group (PENG) block under spinal anesthesia in THA.

Materials and Methods: Following IRB approval and informed consent, ninety patients (aged 67–89, ASA II–III) scheduled for THA under spinal anesthesia were randomized into three groups: PENG block (n=30), ESPB (n=30), and Control (n=30). Each block was performed with 20 ml of 0.2% ropivacaine under ultrasound guidance.

The primary outcome was total opioid consumption within 48 hours.

Secondary outcomes included pain scores, time to first rescue opioids, quadriceps strength, and inflammatory markers (NLR and PLR).

The parametric distribution of numerical variables was evaluated using the Shapiro-Wilk normality test. Group differences were assessed with ANOVA or the Kruskal-Wallis test, followed by post hoc Tukey's or Dunn's tests. Categorical variables were compared using the Kruskal-Wallis test, and contingency analyses were performed with Fisher's exact test.

Results and Discussion: Both the PENG and ESPB groups had significantly lower total opioid consumption (PENG: 3.5 ± 4.0 mg; ESPB: 3.4 ± 3.8 mg) compared to the Control (16.07 ± 3.8 mg, p<0.0001). Time to first rescue opioid was extended in both PENG (12.3 ± 3.2 h) and ESPB (11.2 ± 2.9 h) groups compared to the Control (4.2 ± 1.1 h, p<0.0001).

Pain scores were consistently lower in the PENG and ESPB groups versus the Control. Quadriceps strength was reduced 6h postoperatively in the PENG group compared to ESPB. NLR and PLR were also lower in both block groups.

Conclusion(s): Both PENG and ESPB provide effective postoperative analgesia for elderly patients undergoing THA, reducing opioid consumption and enhancing recovery. These blocks offer valuable options for postoperative pain management in this population.

	Control group (n-30)	PENG group (n=30)	Lumbar ESPB group (n=30)		p control group to the lumbar ESPB group		
Total Opioid Consumption in 48h (morphine mEQ)	16.07 (3.8)	3.5 (4.0)	3.4 (3.8)	<0.0001*	<0.0001*	>0.9999	<0.0001
Time to first rescue opioid analgesia (hours)	4.2 (1.1)	12.3 (3.2)	11.2 (2.9)	<0.0001*	<0.0001*	>0.9999	<0.0001
Postoperative opioid consumption							
yes no	30 0	16 14	16 14	<0.0001*	<0.0001*	1.0	<0.0001
NRS							
4h	4.7 (0.9)	1.7 (0.5)	1.5 (0.5)	<0.0001*	<0.0001*	>0.9999	<0.0001
6h	2.8 (0.6)	1.6 (0.5)	1.7 (0.4)	<0.0001*	<0.0001*	>0.9999	<0.0001
12h	3.3 (0.7)	2.3 (0.5)	1.8 (0.8)	0.0001*	<0.0001*	0.1760	<0.0001
18h	3.2 (0.7)	2.2 (0.7)	2.3 (0.7)	<0.0001*	0.0002*	>0.9999	<0.0001
24h	3.1 (0.8)	2.2 (0.6)	2.0 (0.6)	0.0002*	<0.0001*	0.6590	<0.0001
48h	2.5 (0.5)	2.0 (0.7)	1.8 (0.6)	0.0049*	0.0002*	>0.9999	0.0002*
NLR							
before surgery	1.9 (0.7)	1.8 (0.6)	1.8 (0.7)	0.9999	0.9835	0.9488	0.9532
24h	4.3 (0.9)	3.6 (0.7)	3.6 (0.6)	0.0047*	0.0106*	>0.9999	0.0020*
48h	3.9 (0.7)	2.9 (0.7)	3.0 (0.6)	<0.0001*	0.0001*	>0.9999	<0.0001
PLR							
before surgery	177.3 (46.0)	208.0 (46.0)	154.9 (35.9)	0.1618	0.1822	0.0004*	0.0007*
24h	404.5 (87.7)	298.1 (76.8)	297.6 (80.2)	<0.0001*	<0.0001*	0.9997	<0.0001
48h	320.5 (58.0)	249.9 (67.8)	231.8 (61.3)	0.0002*	<0.0001*	>0.9999	<0.0001
Quadriceps muscle strength							
Knee extension	4.5 (0.7)	2.0 (0.0)	4.0 (0.7)	0.0444*	0.0000	0.0007	0.0400*
3h 6h	4.5 (0.7) 4.9 (0.3)	3.9 (0.8) 4.7 (0.5)	4.2 (0.7) 5.0 (0.0)	0.0144* 0.1416	0.6639 0.7357	0.3307 0.0050*	0.0183* 0.0063*
12h 24h	5.0 (0.0) 5.0 (0.0)	4.9 (0.3) 5.0 (0.0)	5.0 (0.0) 5.0 (0.0)	0.2446 1.0	>0.9999 1.0	0.2446 1.0	0.1323 1.0
Hip adduction	(/	(/	()				
3h	4.4 (0.7)	3.9 (0.9)	4.3 (0.9)	0.0598	>0.9999	0.2989	0.0570
6h 12h	4.9 (0.3) 5.0 (0.0)	4.6 (0.6) 4.9 (0.3)	5.0 (0.0) 5.0 (0.0)	0.0166* 0.0957	>0.9999 >0.9999	0.0012* 0.0957	0.0010* 0.0465*
24h	5.0 (0.0)	5.0 (0.0)	5.0 (0.0)	1.0	1.0	1.0	1.0

12AP01-11

Success rate and effects of ipsilaterally-guided epidural analgesia for anterior cruciate ligament reconstruction: retrospective analysis of 308 consecutive patients

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Background and Goal of Study: Although epidural analgesia usually produces bilateral effects, asymmetric or unilateral blockade can occur depending on the location of the catheter tip in the epidural space. Thus, if we could deliberately place the catheter tip on one side, patients undergoing unilateral knee surgery may benefit from ipsilateral epidural analgesia without intense blockade in the non-operated limb. We started using ipsilaterally-guided epidural analgesia for major knee surgery under our current protocol in January 2021 in our institution.

In the present study, we retrospectively evaluated the rate of placing the catheter tip on the operated-side and effects on pain and motor function when ipsilaterally-guided epidural analgesia was conducted in patients undergoing anterior cruciate ligament (ACL) reconstruction surgery.

Materials and Methods: With IRB approval, we retrospectively analyzed data of consecutive patients undergoing ACL reconstruction surgery under combined spinal-epidural technique between January 2021 and December 2023 in a single institution. All epidural catheters were intentionally inserted toward the operated side, and catheter tip position was assessed by X-ray on postoperative day 1 as a care standard. Epidural analgesia was continued for 3 days.

The data included information on pain scores, analgesic requirements, motor blockade, dermatomes with sensory blockade, and complications over 4 postoperative days. We evaluated the success rate of catheter tip guidance to the operated side.

Additionally, we assessed the efficacy of epidural analgesia based on pain scores and distribution of sensory blockade and motor function.

Results and Discussion: After excluding patients who did not receive standard analgesic regimen, data from 297 patients were evaluated. Most catheters were inserted from the T11/12 or T12/ L1 intervertebral spaces.

The success rate of catheter tip guidance was 92.3%. Ipsilateraldominant sensory blockade on L1~S1 dermatomes was observed in more than 80% of the patients from the first day after surgery. Postoperative pain was well controlled and motor strength of both limbs was well preserved.

Conclusions: Ipsilaterally-guided epidural analgesia demonstrates a significant success rate and analgesic effect. This technique is feasible with motor-sparling and long-lasting analgesia and can benefit patients undergoing ACL reconstruction surgery.

12AP01-12

Combined anaesthesia for non-endocrine surgery in a patient with recurrent pheochromocytoma

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Background: Pheochromocytoma poses major intraoperative risks. Hypertensive crisis, arrhythmias, and myocardial ischemia can be triggered by anaesthetic induction, intubation, surgical stress and pain. Tumour resection is the primary treatment, though a 10% rate¹ of recurrence mandates follow-up. The need for non-endocrine surgery may arise and a specific approach is mandatory.

Case Report: A 80-year-old patient, ASA IV, was scheduled for surgical repair of a trochanteric fracture. His history was relevant for recurrent pheochromocytoma with three previous adrenal surgeries, under medical therapy with α and β -blockade (Phenoxybenzamine 10mg 1x/d, Carvedilol 6.25mg 1x/d). Comorbidities included 3 myocardial infarcts, atrial fibrillation and insulintreated diabetes.

The urgency of the procedure required adequate assessment and an optimal anaesthetic approach. A multidisciplinary team including endocrinology reviewed the patient's history, confirming stable dosage of ☐ and ☐-blockade for over 6 months and normal plasma metanephrine levels. BP and HR were consistent at approximately 110/70mmHg and 65bpm, respectively.

The anaesthetic plan combined general and regional anaesthesia. An arterial line was placed for continuous blood pressure monitoring before induction. US-guided Femoral and Lateral Femoral Cutaneous Nerve blocks were employed. Induction was performed with Etomidate, Fentanyl and Rocuronium, with an iGel no.5 supraglottic device for airway management and Sevoflurane for maintenance.

Analgesia was complemented with Paracetamol. Glycaemic control and positive 500-1000cc fluid balance were ensured. After surgery, the patient remained for 2 hours in the PACU, without incidents. He remained hemodynamically stable throughout the entire perioperative period.

Postoperative recovery was uneventful and he was discharged on day 4.

Discussion: Surgery in patients with Pheochromocytoma needs multidisciplinary approach. Efficient pain management is vital for haemodynamic stability. Peripheral nerve blocks provide excellent pain control extending to postoperative settings. The anaesthetic agents chosen supported minimal haemodynamic variability.

Learning Points: Non-endocrine surgery in pheochromocytoma patients mandates adequate preoperative medical therapy.

By minimizing intraoperative haemodynamic variability and planning for adequate pain control, the anaesthesiologist plays a major role improving postoperative outcomes.

References:

1. doi:10.3390/cancers14122942

12AP02-2

Comparing linear and circular training models in ultrasound-guided regional anaesthesia education

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Background: The effective performance of ultrasound-guided regional anaesthesia requires trainees to develop advanced handeye coordination. While success improves with the number of blocks performed, the best instructional method for skill acquisition remains unclear.

This study aims to compare two training methods in a simulated environment that reflect clinical practices: a "linear" versus a "circular" approach.

Materials and Methods: This study compared two training methods for anaesthesiology residents learning four nerve blocks: femoral, sciatic-popliteal, interscalene, and axillary. Using a highfidelity anatomical model, the Linear Group (LG) practiced each block five consecutive times before moving to the next station, whereas the Circular Group (CG) rotated through all four blocks in sequence, repeating the cycle five times. Post-training evaluation focused on five axillary block attempts.

Each attempt was deemed successful if the resident met three of ten key criteria: avoiding vascular injection, accurately injecting into the target with real-time needle visualization, and completing the procedure within the time limit.

Results: The study was completed by 28 residents, with 14 assigned to each group. Among participants, 14.3% had no prior experience with ultrasound-guided punctures (7.14% in the LG and 21.4% in the CG), and 37.5% had performed fewer than 10 blocks. Final evaluations showed no statistically significant differences in success rates between groups (Table 1).

However, the CG demonstrated superior skill acquisition, achieving significantly higher scores on their final attempt (Table 2).

Conclusions: Our findings suggest that adopting a circular method could benefit residents during regional anaesthesia training. Although limited to a simulation environment, the circular approach may facilitate faster motor skill development due to constant technique variation, enhancing hand-eye coordination.

Attempt	1	2	3	4	5
Linear Group	57,14	50,00	71,43	57,14	64,28
Circular Group	64,28	78,57	85,71	85,71	92,86
Sig. Fisher test	0,50	0,12	0,32	0,10	0,08

Table 1. Success Rates by Attempt During Final Evaluation (%)

Attempt	1	2	3	4	5
Linear Group	8,14 (2,32)	8,00 (2,29)	8,57 (2,41)	8,00 (2,72)	7,86 (2,80)
Circular Group	8,37 (2,34)	8,93 (1,82)	9,29 (1,86)	9,36 (1,65)	9,64 (1,34)
Sig. U Mann Whitney	0,81	0,31	0,37	0,09	0,03

Table 2. Mean and Standard Deviation of Cumulative Evaluation Objectives

12AP02-5

Pericapsular nerve group block vs. fascia iliaca and femoral nerve blocks: optimizing pain control and motor function in frail elderly undergoing hip surgery

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Background and Goal of Study: Effective regional anesthesia techniques are critical for frail elderly patients undergoing hip surgeries, as they reduce complications such as delirium, opioidrelated side effects, and delayed mobilization.

This study compares the pericapsular nerve group block, fascia iliaca compartment block, and femoral nerve block to identify the optimal approach for managing pain, preserving motor function, and improving clinical outcomes.

Materials and Methods: A systematic literature search was conducted in PubMed, Google Scholar, and Scopus, following PRIS-MA guidelines. Inclusion criteria were randomized controlled trials and observational studies published between 2018 and 2024, involving adult patients undergoing total hip arthroplasty or hip fracture surgeries.

Stage	Number of Articles
Articles Identified	546
Duplicates Removed	134
Screened	412
Excluded After Screening	375
Full-Text Articles Assessed	37
Excluded for Eligibility	27
Final Studies Included	10

Results and Discussion: The pericapsular nerve group block demonstrated the most effective pain relief, with lower visual analog scale scores compared to the fascia iliaca compartment block and femoral nerve block at 12 and 48 hours. It also resulted in the lowest opioid consumption and preserved motor function. with significantly reduced quadriceps weakness and earlier mobilization times compared to the other techniques.

These outcomes contribute to reducing postoperative complications like delirium and falls and shorter hospital stays, particularly in frail elderly patients.

Outcome	Pericapsular Nerve Group Block	Fascia Iliaca Compartment Block	Femoral Nerve Block
Pain score (Visual Analog Scale, 12 hours)	3.01 ± 1.08	3.91 ± 1.48	4.2 ± 1.1
Pain score (Visual Analog Scale, 48 hours)	2.1 ± 0.8	3.4 ± 1.2	4.0 ± 1.0
Opioid Consumption (mg)	54 ± 25.67	74.37 ± 18.87	80 ± 22
Quadriceps Weakness (6 hours)	25%	85%	90%
Time to mobilization (hours)	19.6 ± 9.6	26.5 ± 8.2	30 ± 10

Conclusion(s): The pericapsular nerve group block demonstrated superior pain management, opioid reduction, and motor function preservation compared to the fascia iliaca and femoral nerve blocks. Its benefits, particularly in reducing complications and facilitating early mobilization, make it the preferred regional anesthesia technique for frail elderly patients undergoing hip surgeries.

12AP02-6

Erector Spinae Plane Block in Bariatric Surgery: A Meta-analysis of Randomized Controlled Trials with Trial Sequence Analysis

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Background and Goal of Study: Post-operative pain after bariatric and metabolic surgeries may be significant and pain optimisation in obese patients is challenging. Excessive use of opioids in these patients exacerbate their obesity-related comorbidities including risk of airway obstruction from obstructive sleep apnoea and susceptibility to respiratory depression from opioid analgesia. Moreover, such surgeries are inherently associated with higher risk of post-operative nausea and vomitting (PONV), and opioids can exacerbate this. Erector spinae plane (ESP) block has been reported to improve pain and decrease opioid requirements for patients undergoing bariatric and metabolic surgeries.

This meta-analysis aims to evaluate the current evidence on the use of ESP block in bariatric surgeries, focusing on its effectiveness in the reduction in pain and opioid consumption. By consolidating existing research, we aim to provide a clearer understanding of the role of ESP block in this context and identify areas for future investigation.

Materials and Methods: MEDLINE, Embase, Scopus, and CEN-TRAL electronic databases were searched for all studies on ESP block in bariatric and metabolic surgeries from database inception through 9th July 2024. We have only included randomised controlled trials (RCTs) in this study. Two reviewers independently assessed, selected studies, collected data, assessed the risk of bias and quality of evidence.

The primary outcome for this review is opioid consumption in 24 to 48 hours post-operatively.

Secondary outcomes include intra-operative opioid consumption, incidence of PONV, and post-operative pain scores.

Results and Discussion: Six RCTs involving 462 patients were eligible. ESP block significantly reduced opioid consumption in the first 24 to 48 hours after surgery, with a mean oral morphine equivalent daily dose reduction of 28.45mg (95% CI -46.91 to -10.00, p = 0.003, I^2 = 94%).

Trial sequence analysis supported the statistical reliability of our data, favouring ESP block. Time to first request for analgesia was significantly prolonged with ESP block. Intra-operative opioid requirements, post-operative reported pain scores, and PONV rates were reduced in the ESP block group.

Conclusion(s): Bilateral ESP block appears to be a practical, safe and effective modality to improve peri-operative pain outcomes in bariatric surgeries. We propose future research to focus on comparing different block techniques with ESP for such patients.

12AP02-7

Prilocaine in subarachnoid anesthesia: which dosage for the best effectiveness and recovery of motor block?

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Background and Goal of Study: Prilocaine is a local anesthetic commonly used in subarachnoid anesthesia, particularly for lower abdominal and pelvic surgeries. Its favorable pharmacological profile, including a relatively low toxicity and rapid onset, makes it a useful alternative to other local anesthetics like bupivacaine or lidocaine.

This study aims to evaluate the advantages of prilocaine in subarachnoid anesthesia for lower abdominal surgeries and explore the effects of different dosing regimens.

Materials and Methods: A survey was conducted in 7 hospital centers where experienced anesthetists used three different doses of prilocaine and were asked to provide effectiveness evaluations. Patients (n. 60) received one of three doses of prilocaine: low dose (50 mg), medium dose (75 mg), or high dose (100 mg). Sensory and motor block characteristics, hemodynamic stability, and adverse effects were assessed. Pain control, duration of sensory and motor blockade, and recovery times were monitored over a 24-hour postoperative period.

Results and Discussion: The medium-dose group (75 mg) exhibited the most balanced outcomes, with rapid onset, effective sensory block, and satisfactory motor blockade without excessive prolongation. The low-dose group (50 mg) provided adequate analgesia but required higher supplementary doses during surgery. The high-dose group (100 mg) resulted in prolonged motor block and a higher incidence of hypotension and urinary retention.

No significant differences in postoperative pain scores or patient satisfaction were observed among groups. Adverse effects were minimal, with a low incidence of nausea and headache.

Conclusion(s): Prilocaine offers a safe and effective alternative for subarachnoid anesthesia in lower abdominal surgery. A medium-dose regimen (75 mg) provides optimal analgesia with minimal side effects and complications.

Future studies should further investigate its long-term effects and the use of prilocaine in specific patient populations.

References:

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12AP02-8

Continuous adductor canal block improves pain control and quality of recovery in primary total knee arthroplasty surgery: a randomized double-blinded controlled trial

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Background and Goal of Study: Adequate pain management is paramount for total knee arthroplasty (TKA). The duration of single shot adductor canal block (ACB) and IPACK (infiltration between the popliteal artery and capsule of the Knee) block is limited to no more than 24h. Conversely, the use of continuous ACB (CACB) may increase duration of analgesia. The purpose of this study is to evaluate the effectiveness of using CACB in patients undergoing primary TKA.

Materials and Methods: Randomized controlled trial planned to recruit 60 subjects undergoing unilateral primary TKA. All patients receive single shot ACB and IPACK block, spinal anesthesia with mepivacaine and fentanyl and postoperative CACB catheter insertion (ISAFE technique). Depending on the randomization, patients can have a 5ml/h infusion of normal saline (Control group) or ropivacaine 0.2% (Intervention group). Patients are assessed for QoR-15 scores, pain and opioid consumption for the first three postoperative days (POD).

Results and Discussion: Partial analysis of 49 enrolled subjects shows the Intervention group had a better performance (table 1). Groups were similar for age, body-mass index, sex, and laterality of surgery. Catheter related complications and side effects had similar low incidences in both groups.

	Control Group (n = 24)	Intervention Group (n = 25)	Р
POD 1 outcomes			
Pain score at rest, NVS 0 – 10	5 (0 - 8)	1 (0 - 6)	0.008℃
Pain score at movement, NVS 0 – 10	6.67 ± 2.26	4.33 ± 2.66	0.011a
Opioid consumption in last 24h, in mg of OME	19.5 (0 - 82)	5 (0 - 63)	0.004℃
QoR - 15, 0 - 150	109.38 ± 16.16	129.00 ± 12.20	0.0004a
POD 2 outcomes			
Pain score at rest, NVS 0 – 10	5 (0-8)	1 (0-5)	< 0.0001°
Pain score at movement, NVS 0 – 10	7.83 ± 1.88	4.42 ± 2.52	< 0.0001a
Opioid consumption in last 24h, in mg of OME	22.5 (0 - 82)	5 (0 – 35)	0.0007℃
QoR - 15, 0 - 150	109.58 ± 16.25	130.71 ± 10.49	< 0.0001a
POD 3 outcomes			
Pain score at rest, NVS 0 – 10	3.29 ± 2.20	1.88 ± 2.71	0.040a
Pain score at movement, NVS 0 – 10	7.13 ± 2.01	4.21 ± 2.73	0.0001a
Opioid consumption in last 24h, in mg of OME	10 (0 – 75)	5 (0 – 35)	0.015°
QoR - 15, 0 - 150	110.96 ± 17.59	130.58 ± 14.86	0.0005a

Table 1.

Data: mean ± standard deviation, median (minimum - maximum). OME: oral morphine equivalent. a: T-test; c: Mann-Whitney.

These findings suggest that CACB has additional benefit over single shot ACB.

Conclusion(s): CACB improves pain control and quality of recovery after primary TKA.

Reference:

Gleicher Y et al. Questions remain about efficacy of adductor canal blocks. Reg Anesth Pain Med. 2023 Apr;48(4):191.

12AP02-9

Anterior rerratus plane block in heart rate control in a patient with atrial fibrillation

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Background: Atrial fibrillation (AF) with rapid ventricular response (RVR) is common in critically ill patients. This case illustrates how continuous superficial anterior serratus plane block provided effective analgesia for thoracic trauma, helping control heart rate (HR) in a patient with AF and contributing to clinical stabilization.

Case Report: A 52-year-old male with alcohol-related liver cirrhosis (Child-Pugh B) and non-anticoagulated AF was admitted after a fall, sustaining multiple left anterolateral rib fractures (2nd, 3rd, and 5th-11th ribs), left L1 and L3 transverse process fractures, and wedge compression fractures of D7, D11, D12, and L1 vertebrae.

Three days post-admission, he developed nosocomial pneumonia with severe respiratory failure requiring mechanical ventilation and ICU admission. By the 9th ICU day, with respiratory function improving, a weaning attempt from ventilation and sedoanalgesia failed, accompanied by the onset of AF with RVR, which was hemodynamically stable but refractory to medical therapy.

A continuous superficial anterior serratus plane block was performed with 20 mL of 0.375% ropivacaine, followed by a continuous infusion of 0.2% ropivacaine at 8 mL/h. This resulted in significant HR control improvement, enabling sedoanalgesia weaning and extubation on the 12th ICU day without complications.

The perineural catheter was removed after 11 days, transitioning the patient to conventional analgesia and HR control with bisoprolol 5 mg. ICU discharge occurred on the 16th day, with hospital discharge 10 days later.

Discussion: This case highlights uncontrolled pain as a potential AF with RVR trigger and the positive impact of regional anesthesia on pain control in thoracic trauma. The superficial anterior serratus plane block controlled pain and its associated sympathetic response, enabling hemodynamic stability, reduced opioid consumption, and safe sedation weaning.

This block may be an alternative to standard thoracic trauma analgesia techniques (e.g., epidural or paravertebral block), offering a safer, simpler approach with better hemodynamic stability and no anticoagulation adjustments.

Reference:

doi: 10.1016/j.ajem.2023.09.012; . doi:10.1001/jamasurg.2024.0969 **Learning Points:**

- 1. Regional anesthesia is a valuable ally for effective pain management.
- 2. Severe uncontrolled pain can have significant hemodynamic consequences.
- 3. Superficial anterior serratus plane block is a viable alternative for thoracic trauma analgesia.

12AP02-10

Real time ultrasound guided thoracic epidural placement in a patient with severe scoliosis for thoracotomy and laparotomy

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Background: Thoracic epidural (TE) is the gold standard for postoperative analgesia in abdominal and thoracic surgery. Ultrasound (US) real time guidance for the insertion of TE has been demonstrated.

This novel report describes this technique in patient with spinal deformity.

Case Report: A 70 years old woman with severe scoliosis (Figure 1) and chronic pain presented for a open surgical resection of stomach and diaphragm.



Figure 1.

The patient was put in sitting position. Sagittal right paramedian scanning was performed on T9-T10 level. With one operator holding the US and the other performing needling, the Touhy needle was introduced in-plane, caudal-to-cranial and lateral to medial direction (Figure 2).

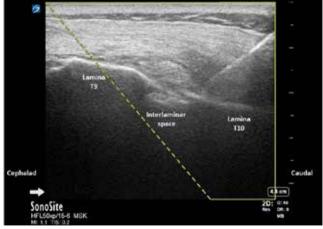


Figure 2.

When engaged to ligamentum flavum, the US was removed and a syringe was attached to the needle. Loss of resistance was found at 4cm from the skin. TE catheter was inserted. Epidural pressure waveform analysis was done (Figure 3).



Figure 3.

TE was kept for five days and provided good sensitive block. Discussion: Real time US guided TE has been described. However its use is limited by requirement for technical expertise. This report focuses on the novelty of using real time US guidance in placement of TE catheter in a patient with severe spinal deformity.

Reference:

Pakpirom J, Thatsanapornsathit K, Kovitwanawong N, et al. Real-time ultrasound-guided versus anatomic landmark-based thoracic epidural placement: a prospective, randomized, superiority trial. BMC Anesthesiol 2022;22(1):198.

Learning Points: Real time US guided TE placement is possible in those with spinal deformity.

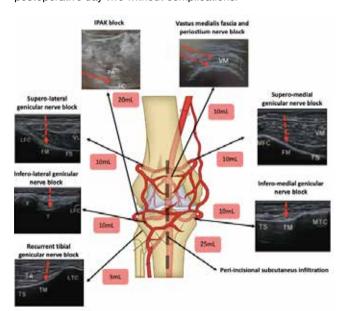
12AP03-1

Modified periarticular vasoconstrictor infiltration for total knee arthroplasty in a fast track program: eliminating tourniquet use

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Background: Total knee arthroplasty (TKA) poses challenges in controlling intra and post-operatory bleeding and managing pain. Tourniquets and tranexamic acid are standard for hemostasis, while nerve blocks address pain. In 2022, ultrasound-guided periarticular vasoconstrictor infiltration (PVI)1 emerged as an alternative to tourniquets and nerve blocks.

Case Report: We present two cases: an 83-year-old woman undergoing left TKA and a 71-year-old woman undergoing right TKA. both ASA 2. Spinal anesthesia with isobaric bupivacaine was followed by ultrasound-guided modified PVI (Figure 1), under strict aseptic conditions 15 to 30 minutes before incision, using 100 mL of ropivacaine 0,2% with 1:200,000 adrenaline, and intraoperative propofol sedation. Tourniquet was not used. Tranexamic acid, antibiotics, and 24mg of dexamethasone were administered per protocol. Intraoperative blood loss was under 200 mL in both cases. The first patient required a single tramadol dose for pain during the first 24 hours, while the second managed pain with non steroidal anti inflammatory drugs and paracetamol, without requiring opioids. Neither of the patients required blood transfusion. Both ambulated within six hours and were discharged on postoperative day two without complications.



e 1: Description of modified PVI. LFC: Lateral femoral condyle, FC: Femoral condyle, FM: Fe FS: Femoral shaft, VL: Vestus lateralis, LFC: Lateral femoral condyle, LTC: Lateral tibial condyle, MFC: Medial dyle, MTC: Medial tibial condyle, PA: Popliteal artery, T: Tibia, TA: Tibialis ante

Discussion: PVI combines adrenaline's vasoconstriction with ropivacaine's anesthetic effects, ensuring hemostasis and analgesia while preserving motor function for early mobilization². Literature favors tourniquet-free techniques for faster recovery and less ischemic complications. Unlike nerve blocks, PVI aligns with enhanced recovery protocols. Results are promising, but larger studies are needed to confirm its long-term benefits.

References:

1. J Clin Anesth. 2024;92.

2. Anaesthesia. 2023;78(2):188-196.

Learning Points: PVI represents a modern, safe, and effective alternative for TKA, aligning with enhanced recovery paradigms to improve patient outcomes and satisfaction.

12AP03-2

Continuous catheter block of deep peroneal nerve for acute neuropathic pain

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Background: Neuropathic pain is a common problem after traumatic amputations. Continuous nerve blocks have been proposed as a way to treat neuropathic pain [1].

While many reports focus on short-term catheterization of sciatic nerve, to our knowledge this is the first reported case of long-term continuous catheter block of a nerve at ankle level.

Case Report: A 50 year old male soldier presented on day 5 after blast injury with left femur fracture and traumatic amputation of 2nd and 3rd toes on the left foot. The patient's quality of life was mainly affected by severe phantom toe pain (8/10 by numeric rating scale) with allodynia and dysesthesia in the foot, causing sleep impairment. This pain did not respond to non-steroidal analgesics and gabapentin.

After trial deep peroneal nerve (DPN) block at ankle level, the patient reported immediate relief.

Next day, a perineural catheter was inserted with ultrasound guidance adjacent to the DPN at ankle level. The catheter was threaded 4 cm along the nerve in distal direction using the out-of-plane technique, and then tunneled intradermally.

With intermittent boluses of 10 mL 0.25% bupivacaine every 8-12 hours, the patient became pain free, and no other pain medication was required.

After 18 days, the pain in the foot and toes was gone, and the catheter was removed without any complications.

Discussion: Our case shows that neuropathic pain after toe amputation can be successfully treated with a perineural catheter placed adjacent to the deep peroneal nerve at ankle level. Selective catheterization of thin distal nerves potentially increases block density.

This may improve efficiency of early neuropathic pain reduction. Placement of a catheter adjacent to DPN at ankle level proved easy and straightforward. Importantly, after 18 days, the catheter did not dislodge, and was not infected.

Reference:

1. Ilfeld BM et al.; PAINfRE Investigators. Ambulatory continuous peripheral nerve blocks to treat postamputation phantom limb pain: a multicenter, randomized, quadruple-masked, placebo-controlled clinical trial. Pain. 2021 Mar 1;162(3):938-955. doi: 10.1097/j.pain.00000000000002087. PMID: 33021563; PMCID: PMC7920494.

Learning Points: Long-term continuous catheter block of deep peroneal nerve at ankle level is possible and feasible to treat neuropathic pain in selected cases.

12AP03-3

Postoperative analgesic efficacy of IPACK or genicular nerve block as an adjunct to femoral triangle block for arthroscopic anterior cruciate ligament reconstruction: a preliminary report

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Background and Goal of Study: Effective acute pain management following arthroscopic anterior cruciate ligament reconstruction (ACLR) promotes joint mobility and facilitates physiotherapy. A combination of femoral triangle block (FTB) and oral multimodal analgesia is commonly recommended for postoperative pain control and enhanced recovery. However, this regional anesthesia technique spares some parts of the knee joint, and some patients still experience postoperative pain.

This study aimed to compare the analgesic efficacy of the infiltration between the popliteal artery and the capsule of the knee (IPACK) and the genicular nerve block (GNB) when combined with FTR

A secondary aim was to evaluate the incidence of posterior knee pain following ACLR with these nerve blocks.

Materials and Methods: This was a single-center, patient- and assessor-blinded randomized controlled trial. Patients scheduled for ACLR were allocated to receive either IPACK or GNB before induction of general anesthesia.

Both FTB and the assigned additional block (IPACK or GNB) were performed using 0.25% bupivacaine and 1% lidocaine with adrenaline. The postoperative analgesic regimen consisted of regular paracetamol, NSAIDs, and tramadol/codeine.

Outcomes included intraoperative fentanyl use, postoperative morphine consumption at 12 and 24 hours, time to first morphine rescue, resting and dynamic pain scores (measured every 4 hours for 24 hours), and the number of patients reporting posterior knee pain.

Results and Discussion: Forty-three patients were recruited, with 22 patients allocated to the IPACK group and 21 to the GNB group. Intraoperative fentanyl use was similar between groups (p=0.281). Postoperative morphine consumption at 12 hours tended to be lower in the GNB group (p=0.093).

Additionally, the time to first postoperative morphine rescue was significantly longer in the GNB group (median [IQR]: 20 [13–34] hours vs. 12 [8–16] hours; p=0.048). Resting and dynamic postoperative pain scores within 24 hours were also significantly lower in the GNB group (p=0.027 and p=0.023, respectively). The incidence of posterior knee pain was approximately 30% in both groups.

Conclusion(s): This preliminary study suggests that GNB is superior to IPACK as an adjunct to FTB and multimodal oral analgesia in terms of postoperative pain management. However, around 1/3 of patients reported postoperative pain in the posterior knee. We suggest that this point requires further investigations.

12AP03-4

One epidural, two battles: navigating labor pain and sickle cell crisis

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Background: Labour heightens vaso-occlusive crisis (VOC) risk in pregnant women with sickle cell disease (SCD) due to stress. dehydration, and hypoxia. Systemic opioids, the standard pain management, can cause sedation and fetal risks. This case highlights managing labour pain and VOC with a single epidural catheter, offering effective relief while minimizing complications of systemic analgesia.

Case Report: A 25-year-old woman with SCD and recurrent VOC presented at 38+2 weeks destation in spontaneous labour with severe VOC pain in her right knee, unresponsive to IV analgesia. A lumbar epidural catheter provided dual-purpose analgesia, with an initial bolus of 20 mg ropivacaine 0.2% and 5 mcg sufentanil, effectively relieving contraction and VOC pain.

Patient-controlled epidural analgesia with ropivacaine 20mg 0,2% boluses ensured excellent pain control. She delivered vaginally without complications.

Postpartum, the catheter managed VOC pain with 14 mg ropivacaine 0.2% every 6 hours, transitioning to on-demand use as pain improved. The catheter was removed after stable pain control with IV analgesics. No adverse events occurred during labour or recovery.

Discussion: This case highlights the efficacy of epidural analgesia for simultaneous management of labour pain and VOC in women with SCD. Epidural analgesia reduces systemic opioid use and associated risks like sedation and maternal-fetal compromise while offering targeted pain relief. Postpartum catheter retention enabled continued VOC management, promoting recovery.

This dual-purpose approach improves comfort, reduces side effects, and optimizes outcomes in this high-risk group. While commonly used for labour pain, its role in VOC management is underreported, emphasizing the significance of this case.

Epidural analgesia is a safe, innovative strategy, enhancing maternal and neonatal outcomes through multidisciplinary care.

References:

- 1. Smith WR, Coyne P, Smith VS, et al. Pain in sickle cell disease: a multidimensional model. Am J Hematol. 2005;80(8):665-670. 2. Ballas SK. Sickle cell pain: a critical reappraisal. Blood.
- 2011;120(18):3647-3656.

Learning Points:

- 1. Labour significantly increases the risk of VOC in pregnant women with SCD.
- 2. Epidural analgesia offers a safe, effective, and dual-purpose solution for labour pain and VOC.
- 3. A multidisciplinary approach is essential in managing high-risk pregnancies, ensuring optimal maternal and neonatal outcomes.

12AP03-5

Intravenous 1 mg midazolam with subarachnoid block is recommended for clinical sedation without hemodynamic compromise - a randomized controlled trial

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Background and Goal of Study: Closed claim studies have highlighted cardiac arrest in healthy young male patients when subarachnoid block (SAB) was given with intravenous (IV) sedation. It was suggested to give lower or no IV sedative agents with SAB as SAB itself has inherent sedative effects due to decreased afferent stimulation of the reticular activating system.

The hypothesis of the present study was that inherent sedation of SAB would correspond to a numerical measure of Bi Spectral Index (BIS) less than 90 (BIS 60-90 sedation recommended in SAB) and that IV midazolam 1 mg, a common practice for intraoperative sedation during SAB, would not be required in these patients.

Primary objective was to compare BIS post SAB with or without IV midazolam.

Secondary objective was to determine hemodynamic stability.

Materials and Methods: 60 patients of age 20-60 years, ASA 1 or 2, undergoing lower limb surgeries were randomly allocated into two groups and given SAB with a 27-gauge spinal needle with 0.5% hyperbaric bupivacaine 2 mL (10 mg) and fentanyl 0.5 mL (25mcg);

Group A (n=30): SAB with 1ml IV saline, Group B (n=30): SAB with IV 1mg midazolam. BIS, heart rate, non-invasive blood pressure, oxygen saturation and respiratory rate were recorded every 15 minutes till 90 minutes.

Results and Discussion: In Group B, BIS was less than 90 but not less than 80 from 30 minutes to at least 90 minutes. In Group A, BIS was less than 90 from 45 minutes to 60 minutes and was more than 90 at all other time frames.

Mean BIS was significantly more in Group A compared to Group B (90.41 +/- 4.05 v/s 86.58 +/- 3.50 respectively) (P< 0.001). Hemodynamic parameters of heart rate, non-invasive blood pressure, oxygen saturation and respiratory rate were comparable between both groups (p value >0.05).

Group	Mean ± SD	"t' Statistics	P-value
Group A	90.41± 4.05	3.915	<0.001**
Group B	86.58± 3.50		

Table 1: Comparison of Mean BIS between Groups

Conclusion: SAB (0.5% bupivacaine 10 mg and 25 ug fentanyl in lower limb surgeries) does not produce numeric BIS <90 and thus may not result in patient sedation and comfort and thus IV midazolam 1 mg should be injected which produces numeric BIS < 90 from 30 minutes to at least 90 minutes without any hemodynamic compromise. Duration of effect of sedation of IV midazolam 1 mg beyond 90 minutes should be studied.

12AP03-6

Successful combined spinal-epidural anesthesia for caesarean section in a super-super obese patient with BMI > 70 kg/m² - a case report

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Background: Obesity during pregnancy is increasingly common and associated with elevated perinatal risks. Super-super obesity (BMI ≥ 60 kg/m²) is rare, and anesthetic guidelines for such patients are limited. Taylor et al. recommend interdisciplinary assessment, early neuraxial techniques, and avoidance of emergency cesarean sections due to the high risks and complex management1.

We report a successful case of combined spinal-epidural anesthesia (CSE) in a super-super obese patient.

Case Report: A 25-year-old woman with a BMI of 72 kg/m² (225 kg, 176 cm) was admitted for her first childbirth. Her medical history included obstructive sleep apnea, bronchial asthma, and pregnancy-induced hypertension.

After multidisciplinary planning, an elective caesarian section was performed. CSE was conducted with ultrasound-guided midline and epidural depth assessment. Single-shot spinal anesthesia with 11 mg isobaric bupivacaine was placed at L2/3, followed by an epidural catheter at the same level. The patient was positioned in the ramp position and received nasal high-flow oxygen. Both mother and newborn were discharged in good health the following day.

Discussion: This case highlights the importance of multidisciplinary planning in managing super-super obese patients (1).

CSE with ultrasound guidance offers flexibility for extending the block via an epidural catheter, often necessary in prolonged sur-

Single-shot spinal anesthesia ensures reliable blockade and reduces the risk of excessive cephalad spread compared to epidural anesthesia. Isobaric bupivacaine minimizes the risk of failed spinal anesthesia in the ramp position, compared to hyperbaric agents2.

Moreover, CSE with ultrasound guidance may facilitate intrathecal space identification compared to standard single-shot spinal techniques1.

References:

- 1. Taylor CR et al. Obesity and obstetric anesthesia. Local Reg Anesth. 2019;12:111.
- 2. Demilie AE et al. Failed spinal anesthesia: incidence and factors. BMC Anesthesiol. 2024;24:129.

Learning Points:

- Multidisciplinary planning and avoiding emergency sections are vital for safely managing super-super obese patients.
- CSE is preferred in complex cases for its reliable single-shot spinal anesthesia and the flexibility to extend block duration with an epidural catheter.
- Ultrasound-guided CSE improves intrathecal space identification in super-super obese patients.

12AP03-7

Pericapsular Nerve Group (PENG) block for shoulder arthroscopy in day case surgery

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Background: Interscalene brachial plexus block is the goldstandard regional technique for shoulder surgery. Respiratory compromise poses an important consideration in day-case surgery. Pericapsular nerve group (PENG) block has been used for postoperative analgesia without pulmonary impact. The authors aim to perceive its analgesic effectiveness following shoulder arthroscopy surgery.

Case Report: Three patients were scheduled for shoulder arthroscopy and ligamentoplasty due to rotator cuff tear. Combined anesthesia (intravenous general anesthesia with a regional technique) was proposed. An ultrasound-guided (USG) shoulder PENG block (20mL 0,375% ropivacaine) was applied (Figure 1). Intraoperative multimodal analgesia was used: 50µg fentanyl and 2mg/kg intravenous lidocaine before induction; 2g magnesium sulfate, 20mg ketamine, and 1g paracetamol. Postoperative analgesia consisted of 1g paracetamol 8/8h, 60mg acemethacin, and SOS 100mg tramadol. All procedures were uneventful.

Table 1 presents patient's data, 24 hour's numerical rating scale score (NRSS) and pain control. No pulmonary complications or motor blocks were reported. Numbness and paresthesias were noted until 12 hours after surgery.

Patie	nt Age (years)	Gender	ASA- PS	Anesthesia duration (min)	Surgery duration (min)	NRSS 1 hour	NRSS 12 hours	NRSS 24 hours	Rescue analgesia in first 24 hours
1	49	Female	2	83	46	0	0	3	100 mg tramadol
2	67	Female	2	77	44	0	4	0	100 mg tramadol
3	61	Female	2	68	36	0	0	3	None

Table 1.



Figure 1. USG shoulder PENG block (blockade area marked in blue shade)

Discussion: Pain management after day-case shoulder surgery is crucial for patient rehabilitation. All patients were discharged 6 hours after surgery, with no respiratory complications noted, USG shoulder PENG block was able to provide adequate postoperative pain control.

References:

1. Küpeli İ, Kara MY. Anesthesia or analgesia? New block for shoulder surgery: pericapsular nerve group block. Braz J Anesthesiol 2022:72(5):669-672.

Learning Points: Shoulder PENG block may be a promising option for regional anesthesia in day-case surgery, with no pulmonary function compromise, as its combination with conventional multimodal approach seem to provide successful analgesia.

12AP03-9

Long term catheterization of sciatic nerve for management of acute pain in combat injuries: a case series

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Background: Combat lower limb injuries cause severe acute pain from tissue and nerve damage, and require surgical debridements and painful negative pressure wound therapy over many weeks. We present a series of cases where sciatic perineural catheterizaition was routinely used for continuous pain relief over unusually long times.

Case Report: 45 male soldiers with severe nociceptive and/ or neuropathic pain from recent combat injuries to lower limbs were included. 51 sciatic perineural catheters were inserted under ultrasound guidance at upper, middle, or lower thigh levels. The catheters were threaded 5-10 cm inside the paraneurium, tunnelled intradermally and covered with transparent film dressing. All patients received 0.25% bupicavaine as infusion or regular boluses.

Subsequent perineural analgesia was patient-driven, i.e. every day patients were asked if they want to keep the catheter. Next day after catheter placement, 44 of 51 catheters were assessed by patients as effective in reducing pain and improving sleep (success rate 88%).

Of these 44 effective catheters, 17 (39%) were maintained till resolution of pain, 5 (11%) were removed unintentionally, and 5 (11%) were removed because of complications. 17 (39%) effective catheters were lost to follow-up (last follow-up date was recorded as catheter removal date). Median catheter in situ time was 14 days (range 3 to 57, total of 719 catheter-days).

Complications included 1 case of painful sciatic neuropathy (onset on day 9 after insertion of a second popliteal catheter, the patient was then lost to follow-up), 1 case of worsening of phantom limb pain under continuous sciatic nerve block, and 3 minor local infections (1 infection per 240 catheter-days), which resolved upon catheter removal and required no treatment.

Discussion: Our work shows that perineural sciatic catheters can be safely maintained for weeks. This is in contrast with most studies [1], where duration of perineural catheterization is usually limited to 7 or 10 days.

Prolonged sciatic nerve catheterization is a feasible way to control acute lower limb pain, which persists for a longer period of time, such as in combat injuries.

References:

1. Hagen Bomberg et al.; Prolonged Catheter Use and Infection in Regional Anesthesia: A Retrospective Registry Analysis. Anesthesiology 2018: 128:764-773

Learning Points: Perineural sciatic catheter can be effectively used for pain relief for much longer than 2 weeks with few complications.

12AP03-11

Identifying the barriers faced by anesthesia providers in performing nerve blocks for hip fracture surgeries

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Background and Goal of Study: Nerve blocks, including fascia iliaca block (FIB), femoral nerve block (FNB), and pericapsular nerve group (PENG) block, are effective in managing pain for hip fracture surgeries. They reduce opioid use, minimize delirium, and shorten hospital stays. Despite their benefits, adoption remains low due to barriers like inadequate training, resource shortages, and time constraints.

This audit aimed to identify these barriers at Our Lady of Lourdes (OLOL) Hospital to improve care and procedural consistency.

Materials and Methods: A survey was conducted among 45 anesthesia providers, with a 71.1% response rate. Respondents included consultants, NCHDs, trainees, and SHOs. Data on demographics, training, confidence, and barriers to performing nerve blocks were collected via Google Forms between September 17 and October 2, 2024. Quantitative data were analyzed descriptively, and qualitative responses underwent thematic analysis.

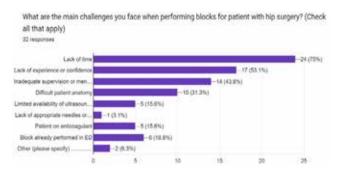


Figure. Main challenges when performing blocks for patient hip surgery.

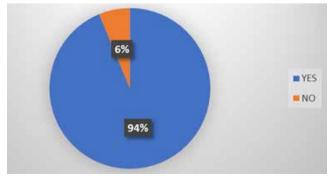


Figure. Interest in further training.

Results and Discussion: Most respondents (81.25%) had more than five years of experience, but formal training in nerve blocks was limited. Only 37.5% had training in FIB. 46.8% in FNB, and 9.4% in PENG. Confidence was highest for FIB (31.25% very confident) and lowest for PENG (6.25%).

Barriers included time constraints, lack of ultrasound machines, insufficient training, workflow inefficiencies, and limited mentorship. FIB was the most commonly performed block, but PENG was rarely utilized due to a lack of training and awareness.

Addressing these challenges through structured training, better resources, and mentorship can significantly improve nerve block adoption.

Conclusion(s): By targeting identified barriers, OLOL Hospital can enhance the use of nerve blocks, improving patient outcomes and adherence to best practices. Strategies include workshops, better resource allocation, mentorship, and optimized workflows.

12AP03-12

Safe and tailored: breast cancer surgery under regional anesthesia with low concentration ropivacaine for high-risk patient

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Background: Breast cancer surgery under regional anesthesia (RA) provides significant benefits including faster recovery and improved outcomes.

This case is noteworthy for using of low concentration(0.35%) ropivacaine in a frail patient, which is uncommon as higher concentrations(0.5%) are typically used to ensure effective anesthe-

Case report: A 72-year-old woman with significant dyspnea from likely C3 and C4 cervical myelopathy was diagnosed with left breast intraductal carcinoma, necessitating left mastectomy and possible axillary clearance. Decision made to proceed only under RA given her frailty. Ropivacaine 0.35% with adrenaline 1:200K,totaling 50mls(175mg) was prepared. Paravertebral block were performed at left T2 and T5 levels using 15mls each, left pectoral plane 2 block with 5mls given between pectoralis major and minor,10mls underneath pectoralis minor and left superficial cervical plexus block with 5mls(total 50mls).

Intraoperative sedation started due to patient's anxiety, but the block was effective with no additional LA required. She was discharged well next day.

Discussion: This case highlights the effectiveness of using 0.35% ropivacaine for mastectomy under RA. While literature suggests a minimum effective concentration(MEC) of around 0.257%, many studies reported at least 0.5% for paravertebral blocks in mastectomy.

This case aims to enhance understanding of safe anesthetic practices in high-risk populations, showing that lower concentrations can provide satisfactory anesthesia without compromising efficacy.

References:

1. Fang, G., et al. (2016). The minimum effective concentration(MEC90) of ropivacaine for ultrasound-guided supraclavicular brachial plexus block. Anaesthesia,71,700-705.

- 2. Pangthipampai, P.,et al. (2020). Ultrasound-guided multilevel thoracic paravertebral block and its efficacy for surgical anesthesia during primary breast cancer surgery. Journal of Pain Research.13.1713-1723.
- 3. Chhabra. A., et al. (2021). Paraverte bral anaesthesia with or without sedation versus general anaesthesia for women undergoing breast cancer surgery. Cochrane Database of Systematic Reviews,2(2),CD012968.

Learning points: This case emphasizes the feasibility of using 0.35% ropivacaine for RA in breast cancer surgeries, especially in high-risk patients.

It highlights the importance of tailoring anesthetic techniques to individual patient needs while ensuring safety and efficacy, contributing valuable insights into management strategy for vulnerable populations.

12AP04-1

Maxillary nerve block for transsphenoidal surgery: two case reports

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Background: Transsphenoidal surgery (TSS) is commonly performed for pituitary tumours. Although this type of surgery is minimally invasive compared to craniotomy, some patients experience postoperative pain. The efficacy of maxillary nerve block (MNB) for endoscopic sinus surgery¹ has been reported in several cases, but there are few reports on TSS2.

We report two cases of MNB for TSS.

Case report: A 50-year-old man and a 36-year-old woman are scheduled for TSS for a pituitary tumour. They had no significant past medical history. After the induction of general anaesthesia, the patients underwent bilateral ultrasound-guided MNB with 2 mL each of 0.5% ropivacaine. No opioids were required except for a continuous intraoperative continuous infusion of remifentanil (up to 0.2 mcg/kg/min).

On awakening from general anaesthesia, the patients reported no pain during their hospital stay and did not require postoperative analgesia. No complications related to MNB were observed.

Discussion: The anatomical structures involved in the TSS procedure include the nasal cavity (nasal mucosa), sphenoid bone (sinus) and dura mater. Most of these are innervated by the branches of the maxillary nerve and postganglionic fibres from the pterygopalatine ganglion. General anaesthesia with MNB for TSS reduces perioperative opioid consumption and its side effects. It may also enable rapid emergence from anaesthesia and early neurological assessment.

Although There are several case reports of infraorbital nerve block for TSS on perioperative analgesia³, we did not find any case report of MNB. We performed ultrasound-guided MNB by injecting a local anaesthetic into the pterygopalatine fossa under the zygomatic arch. The pterygopalatine fossa is filled with fat and contains branches of the maxillary nerve, the pterygopalatine ganglion and the maxillary artery.

Local anaesthetic injected into the pterygopalatine fossa spreads easily and a small amount of local anaesthetic is sufficient to provide adequate analgesia. The procedure is considered safe as long as care is taken to avoid vascular puncture and excessive needle advancement.

References:

- 1. Adhip N, et al. Indian J Anaesth 2024; 68(8): 706-711.
- 2. R Chadha, et al. Acta Anaesth Scand 1997: 41: 35-40.
- 3. Edward R. et al. Can J Anesth 2009: 56: 584-589.

Learning points: Ultrasound-guided MNB combined with general anaesthesia may provide good analgesic effects and reduce opioid consumption.

12AP04-2

Crystallization of mixtures of local anaesthetics with and without adjuvants in human cerebrospinal fluid - A semiguantitative in-vitro study

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Background and Goal of Study: The use of mixtures of Local Anaesthetics (LA) with or without adjuvants is common practice in regional anaesthesia (RA), especially in obstetric patients. Most of these mixtures are not approved by governing bodies, and evidence for clinically relevant efficacy is low or absent. Recent studies reported significant crystal formation in some widely used LA-LA / LA-adjuvant mixtures1.

This follow-up study aims to assess the behaviour of LA-LA and LA-adjuvant mixtures in human cerebrospinal fluid (CSF) as a model for interstitial fluid.

Materials and Methods: The ethics committee approved this study. Fractionated additions of human CSF with commonly used combinations of LA+LA or LA+adjuvants (see Table 1) were produced. These mixtures were subsequently assessed for Grade of Crystallization (GoC) using a semiquantitative light-microscope scale (Grade 0 to 5), repeated up to 24 hours.

Additionally, pH of the LA-(adjuvant)-CSF mixtures was assessed at baseline (t₀) and after 24 hours (t_{24b}).

Results and Discussion: All mixtures showed GoC of Grade 4 or 5 in a time-dependent pattern (Table 1). Particularly ropivacaine + dexamethasone and ropivacaine + lidocaine + sodium bicarbonate developed high-level GoC early after admixture.



Combination*	pH t ₀	pH t _{24h}	GoC t ₀	GoC t ₁₅	GoC t ₃₀	GoC t ₆₀	GoC t ₁₂₀	GoC t ₁₈₀	GoC t ₂₄
Cerebrospinal fluid (CSF)	7,7								
Ropivacine 0,75% + Mepivacaine 2% (1 : 1)**	7,0	7,21	1	2	2	3	2	3	5
Ropivacine 0,75% + Chloroprocaine 2% (1 : 1)**	7,3	7,13	3	3	3	4	5	5	5
Ropivacine 0,75% + Dexamethasone (15 : 1)**	7,1	6,97	4	5	5	5	5	5	5
Ropivacaine 0,75% + Lidocaine 2% + NaBic 8.4% (5 : 5 : 0,5)**	7,3	7,55	3	4	4	4	5	5	5
Lidocaine 2% + Ropivacaine 0.75% (1 : 1)**	7,1	7,28	2	3	3	3	3	4	4
Lidocaine 2% + NaBic 8.4% (10 : 1)**	7,4	7,92	1	2	3	2	2	2	4

^{*} Mixing ratio for mixture: CSF was 1:1; ** mixing ratio in brackets is between first, second (and third) substance. GoC = Grade of crystallization (0: crystal size < 10 μ m; 1: one solid body >10 μ m; 2: 2–10 solid bodies >10 µm; 3: > 10 solid bodies >10 µm or one solid body >50 µm; 4: > 100 solid bodies >10 µm, or more than one solid body >50 μ m, or one solid body >100 μ m; 5: > 100 solid bodies >10 μ m and more than one solid body >50 μ m or more than one solid body >100 μ m)

Table 1.

Conclusion: Our results raise concern about the safety of using these mixtures in RA, as they may form persisting particulate bodies. Several reports indicate the risk of severe neurological injury when particulate substances are injected for RA2.

Their use should be critically weighed against their clinical benefit.

References:

- 1. Hoerner E et al. Reg Anesth Pain Med 2024. doi: 10.1136/rapm-2023-105229.
- 2. Rathmell et al. Anesthesiology 2015. doi: 10.1097/ ALN.0000000000000614

12AP04-3

Median effective local anaesthetic volume for ultrasound guided parasacral sciatic nerve blockade: a prospective dose finding study

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Background and Goal of Study: The parasacral sciatic nerve block (PSNB) is an effective approach for lower limb surgeries, however, the median effective dose of Ropivacaine required for ultrasound guided PSNB is yet undetermined.

This study aims primarily to find the median effective volume of 0.5% ropivacaine for the PSNB for surgical anesthesia in 50% and 95% patients (ED₅₀, ED₉₅).

Materials and Methods: Study was conducted after ethiclearance (IEC-INT/2023/MD-961) and trial registry (CTRI/2023/05/053126) on 55 American Society of Anesthesiologists physical status I-III patients, from the ages of 18 to 80 years, undergoing below knee orthopedic surgeries under combined ultrasound-guided femoral and PSNB. In this study, we chose 20 ml of 0.5 % Ropivacaine as the starting dose.

Contingent on the success of the block, the volume of local anesthetic was escalated or de-escalated using Dixon's up-anddown method by 2 ml. Sensory and motor blockade was evaluated at 5 minute intervals for a period of 30 minutes by grading on a 4-point scale. A score of 3 for sensory blockade and 2 or more for motor blockade was accepted as successful surgical anesthesia. Data was analysed using isotonic regression with a pooled adjacent violators algorithm and a bootstrapping approach to estimate the $\mathrm{ED}_{\mathrm{50}}$ and $\mathrm{ED}_{\mathrm{95}}$ of 0.5% Ropivacaine with confidence intervals (CI).

Results and Discussion: The volume of local anesthetic administered for PSNB was found to be in the range of 12 - 20 ml. Centered isotonic regression with a bias-corrected Morris 95% CI derived by bootstrapping showed ED₅₀ of 16.5 (15.4-17.7) ml and ED₀₅ of 19.6 (95% CI 19.4-22.4) ml.

Conclusion(s): In patients undergoing below knee orthopedic surgeries, a 20-ml dose of 0.5% Ropivacaine will likely generate effective surgical anesthesia on PSNB guided by ultrasound in 95% of patients.

References:

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12AP04-4

Non-intubated video-assisted thoracic surgery (NI-VATS) for complicated pleural effusion under pararavertebral, serratus anterior plane and cervical vagus nerve block in a patient with multiple co-morbidities - a case report

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Background: NI-VATS with peripheral nerve blocks and sedation is a safer alternative to traditional VATS, especially for elderly or critically ill patients with severe co-morbidities. Unlike traditional VATS, it avoids deep sedation and muscle relaxation required for intubation, addressing issues like pain and delayed diaphragm recovery that can lead to atelectasis. Cough suppression via cervical vagus block ensures better visualization of the operative field.

Case report: A 58-year-old male with heart failure (EF 57%, previously 25%), stage 5 chronic kidney disease, and pulmonary tuberculosis presented with dyspnea from complicated pleural effusion despite chest tube thoracotomy. He was positioned in the left lateral decubitus position, and five nerve blocks were performed under ultrasound quidance.

Ropivacaine 0.5% was used for Paravertebral Right T5 and T7 (7 mL each) and for Cervical Vagus Nerve Block (2.5 mL). Serratus Anterior Plane Block was performed using Ropivacaine 0.25% (15 mL).

Sedation was maintained with low-dose Propofol TCI (1-2.5 mcg/ mL) to allow spontaneous ventilation. The procedure was successfully completed.

Discussion: Single-lung ventilation under general anesthesia increases risks of pneumonia, cardiac performance issues, and neuromuscular complications due to sedation and muscle relaxation. NI-VATS avoids these risks by maintaining spontaneous breathing, thereby making it a viable alternative for pleural effusion and treatment3. Paravertebral and serratus anterior plane blocks provide effective post-operative analgesia, enabling early incentive spirometry to prevent atelectasis.

Cervical vagus nerve block suppresses coughing, ensuring a stable operative field without the need for intubation or lung isolation. This approach is ideal for high-risk patients with multiple co-morbidities.

References:

- 1. Yanik, F. Current Overview of Awake, Non-Intubated, Video-Assisted Thoracic Surgery. Videosurgery and Other Miniinvasive Techniques, 2023.
- 2. Zhang, Y., et al. Serratus Anterior vs Paravertebral Nerve Block for VATS: A Randomized Trial. Videosurgery and Other Miniinvasive Techniques, 2021.
- 3. Karadayı Ş, et al. The Role of Awake VATS in Pleural Effusion Diagnosis and Treatment. Turk Toraks Derg, 2013.

Learning points: Combining paravertebral, serratus anterior plane, and cervical vagus nerve block techniques is a safe and effective strategy for NI-VATS in high-risk patients with multiple co-morbidities.

12AP04-5

Evaluating the impact of erector spinae plane nerve catheters for rib fractures - Should we be inserting more as standard practice?

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Background and Goal of Study: Rib fractures caused by blunt trauma are associated with significant morbidity and mortality. Treatment is supportive care through multimodal analgesia, focussed on preventing pulmonary complications. Inserting erector spinae plane (ESP) catheters has significant benefits without the risks of sedation and respiratory depression caused by opiates. In our institution, these are sited on the basis of age, comorbidity, analgesic requirements and chest wall injury (CWI) score. This study evaluated the benefits of ESP catheters in chest wall injuries (CWI) in a UK trauma unit.

Methods: We conducted a retrospective single centre study of all 216 patients presenting with a CWI at a UK trauma unit in 2022. Data was collated from electronic patient records and the Trauma Audit Research Network database. Our data included CWI (STUMBL) scores, Rockwood frailty scores, total opiate consumption and length of hospital stay.

Results and Discussion: Patient demographics are summarised in Table 1.

	ESP	No ESP
Average Age	57.1	76.5
Rockwood Frailty Score	3.1	4.6
Chest Wall Injury Score	22.8	18.7
Length of Hospital Stay Isolated Chest Wall Injuries (Days)	8.4	12.9

Table 1.

Patients with ESP catheters were younger and less frail with higher CWI scores. However mortality risk is greatest in the older population with an average age of 80 compared to 72 in survivors, confirming that this group is most vulnerable to complications. To exclude the confounding effect of other injuries, we reviewed the 30 patients who had sustained an isolated CWI, 11 of whom received ESP analgesia. These patients spent an average 4.5 days fewer in hospital compared to those without. Patients with a CWI >30 had a significant reduction in daily morphine consumption, see Figure 2.

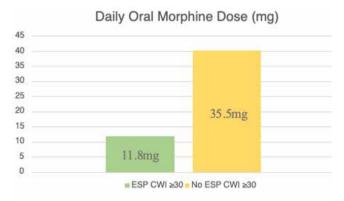


Figure 2. Graph showing daily oral morphine dose in patients with and without an ESP catheer in context of a CWI score >30.

Conclusion: The data demonstrates the significant benefits of ESP catheters for CWI patients, especially in reducing opiate consumption and length of hospital stay.

Future treatment pathways should lower the thresholds for catheter insertions in the older, frailer population given their higher risk of mortality.

12AP04-6

Perioperative analgesic management for sacral chordoma resection in two stages: a case report

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Background: Chordoma is one of the most common tumors of the spine, which benefits from extensive en bloc surgical resection. These types of surgeries, performed in two stages, are longlasting, highly complex, and that involve extensive and radical resection are exceptional and pose a significant challenge from an anesthetic perspective.

Opioids are considered the treatment of choice for both intraoperative and postoperative pain, with intrathecal morphine being one option to consider in this context⁽¹⁾.

Case report: The multidisciplinary approach for an en bloc resection of sacral chordoma in two surgical stages is described, where pain control both intraoperatively and postoperatively was based on the use of intrathecal morphine (400 and 350 micrograms, respectively) combined with multimodal analgesia under general anesthesia.

The patient had good pain control, with only one episode of nausea and vomiting after the first surgery and no episodes of respiratory depression.

Discussion: The administration of intrathecal morphine is a simple and quick procedure with a low complication rate. The "analgesic ceiling" beyond which the adverse effects outweigh the analgesic benefits has not been well established.

Although intrathecal morphine has been shown to reduce opioid requirements both intraoperatively and postoperatively, it is known to increase the risk of adverse effects such as nausea, vomiting, and respiratory depression, among others ⁽²⁾.

References:

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- 2. Fléron MH, Weiskopf RB, Bertrand M, et al. A comparison of intrathecal opioid and intravenous analgesia for the incidence of cardiovascular, respiratory, and renal complications after abdominal aortic surgery. *Anesthesia and Analgesia*. 2003;97(1):2–12.

Learning points: In our experience, for highly complex surgeries that, due to their characteristics, result in significant postoperative pain, the optimal dose may be between 4.5-5 mcg/kg of intrathecal morphine, always including prophylactic treatment for postoperative nausea and vomiting.

12AP04-7

Comparative evaluation of deep versus superficial erector spinae plane blocks for post-operative analgesia in modified radical mastectomy

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Background and Goal of Study: The Erector Spinae Plane (ESP) Block is a promising technique for post-operative analgesia across various surgical procedures. Two distinct approaches have been described¹: the Superficial and Deep ESP Blocks.

This study aimed to compare the duration and quality of analgesia provided by these two techniques in female patients undergoing Modified Radical Mastectomy (MRM).

Materials and Methods: After approval from the IEC, we conducted a prospective, double-blinded, randomized comparative study. 44 ASA I and II female patients, aged 18-65 years, scheduled for MRM, were randomly assigned to either Group DES (Deep ESP block) or Group SES (Superficial ESP block). After administering general anesthesia, the block was performed as per the allocated group with 20 mL 0.25 % Bupivacaine and 6 mg Dexamethasone at T4 level. CONOX® (Fresenius Kabi) monitor was used to assess intra-operative analgesia and administer additional fentanyl boluses. Post-operatively, the time to the first request of rescue analgesia, NRS scores and total analgesic consumption over 24 hours were recorded. The Unpaired t-test, Mann-Whitney U Test (Continuous variables) and Chi square tests (Categorical variables) were used for statistical analysis.

Recorded Parameter	Group	Group	p-value
	DES	SES	(Statistical Test)
Percentage of patients requesting rescue analgesia within the study period of 24 hours post-operatively	18.2 %	63.6 %	0.002 (Chi Square Test)
Time to first request of rescue analgesic in hours (mean \pm SD)	9.875	10.429	0.721
	± 5.1377	± 4.3494	(Mann-Whitney U Test)
NRS scores at 12 hours post-operatively (mean ± SD)	0.55	1.86	0.010
	± 1.224	± 1.885	(Mann-Whitney U Test)
Analgesic consumption over 24 hours post-operatively in mg of diclofenac (mean \pm SD) (neither group had requirement of the second rescue analgesic tramadol)	17.05	51.14	0.004
	± 39.63	± 42.59	(Mann-Whitney U Test)

Table 1: Post-operative parameters recorded.

Results and Discussion: In the Deep ESP Block group, the cranio-caudal spread of the drug was likely to be more and hence covered multiple dermatomes. In the Superficial ESP block, the drug would need to cross an additional muscle layer in order to reach its site of action.2

Conclusion(s): Both the Deep and Superficial ESP Blocks had significant opioid-sparing effects. The Deep ESP Block provides superior and longer-lasting postoperative analgesia compared to the Superficial ESP Block in patients undergoing Modified Radical Mastectomy.

References:

1. Forero M, Adhikary SD, Lopez H, Tsui C, Chin KJ. The Erector Spinae Plane Block: A Novel Analgesic Technique in Thoracic Neuropathic Pain. Reg Anesth Pain Med 2016;41(5):621-7. 2. Sinha C, Kumar A, Kumar A, Kumari P, Singh JK, Jha CK. Deep versus superficial erector spinae block for modified radical mastectomy: A randomised controlled pilot study. Indian J Anaesth 2021;65(2):97-101.

12AP04-8

Possible local anesthetic systemic toxicity following ultrasound-guided bilateral paravertebral block with ropivacaine

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Background: Local Anesthetic Systemic Toxicity (LAST) is a rare but potentially life-threatening complication of local anesthetics. Its pathophysiology is primarily understood through animal models and case reports. This case reports a possible LAST following a bilateral ultrasound(US)-guided paravertebral block with ropivacaine.

Case Report: A 75-year-old male with a mandibular tumor causing limited mouth opening (~1cm) was admitted electively for computed tomography (CT)-guided percutaneous endoscopic gastrostomy placement. The anesthetic plan involved sedation followed by bilateral US-guided paravertebral block, level T8 with 135mg ropivacaine on each side, totalling 3mg/kg. Seconds after the second injection, the patient experienced a generalized tonicclonic seizure.

Emergency anesthesia team and internal emergency team were alerted, and the patient was repositioned, oxygenated, and given 10 mg of intravenous diazepam, terminating the seizure. Due to persistent bradypnea and postictal state, emergent nasotracheal intubation was performed.

Following the event the patient displayed return of motor function and intact pupillary reflexes. Hemodynamic stability and sinus rhythm were maintained throughout. The procedure was completed without further complications, and the patient was extubated about 2 hours after the event with no complications.

Discussion: The seizure was most likely due to Local Anesthetic Systemic Toxicity (LAST). Accidental local anesthetic injection into the neuraxis was unlikely given the US-guided technique and the absence of motor or sensory deficits shortly after the event. A new-onset epilepsy was ruled out by neurology and a brain CT excluded intracranial lesions. A transient low cardiac output event, such as vasovagal syncope, was not detected but cannot be excluded.

The rapid onset suggested a systemic reaction to ropivacaine, either from unnoticed intravascular injection or absorption after the first injection. Bilateral paravertebral blocks carry a recognized risk for LAST due to their proximity to major vascular structures.

Reference: Gitman M, Reg Anesth Pain Med. 2018

Learning Points: LAST is a rare but serious complication of local anesthetic use, especially in techniques involving proximity to blood vessels.

Early recognition and intervention, including airway management and seizure control, are crucial for patient safety.

Ultrasound guidance may reduce but does not eliminate the risk of LAS

12AP04-9 **Epidural catheter: how long is too long?**

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Background: Existing literature on infection rates associated with epidural catheters focuses on short-term use, and ranges from 0.8 to 4.9%. Prolonged use of epidural catheters lacks definition and remains controversial, owing to potentially increased infec-

This study aims to assess the incidence of epidural catheter-related infection when the catheter remains in situ beyond 10 days. Methods: A single-centre, retrospective cohort study was conducted, including all adult patients followed by the Acute Pain Unit from 2021 to 2022 who had an epidural catheter in place for a minimum duration of 10 days.

The primary composite outcome was the occurrence of any catheter-related infection, defined as skin and soft tissue infections or radiologically confirmed spinal space infections, requiring either medical or surgical intervention. Cases of self-limited local inflammatory signs were excluded.

Results: Among 2872 adult patients with continuous epidural analgesia, 347 met the inclusion criteria. Most were male (66.6%), with a median age of 64 years. The majority of epidural catheters (73.2%) were placed for a surgical procedure, most frequently at a thoracic level (51.9%). The duration of catheter use ranged from 10 to 92 days.

The overall incidence of catheter-related infection was 1.7% (95%) CI 0.7 - 3.9%). Three patients (0.9%) had skin or soft tissue infections managed with medical treatment, two (0.6%) had a spinal infection treated conservatively, and one (0.3%) developed an epidural abscess requiring surgical intervention. Catheters were removed at the first sign of infection in all six cases, which occurred after a mean duration of 42 days. Despite the infection, no cases of permanent functional impairment or mortality were reported.

Conclusion: In our study, 98% of epidural catheters in situ for more than 10 days remained infection-free, a rate similar to that previously described for short-term use.

However, in the absence of a clear definition of prolonged catheter use, the potential severe risks still warrant careful considera-

12AP04-10

Periarticular infiltration analgesia vs. continues femoral nerve block for post operative pain managment in knee arthroplasty - a single center retrospective cohort study

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Background and Goal of Study: Pain control in Total Knee Arthroplasty surgeries (TKA) is crucial for surgical outcomes and currently two widely used methods including Continuous Femoral Nerve Block (CFNB) catheter and Peri-articular Infiltration Analgesia (PAI) performed by surgeon.

The primary objective to evaluate the efficacy of PAI combined with single-shot adductor canal block compare with CFNB by assessing pain scores at rest and during movement at 24 and 48 hours following unilateral TKA surgeries performed under spinal anesthesia using low volume, low concentration of Local anesthetic with weak opioid (tramadol) as rescue analgesia in postoperative period.

The secondary objective to assess the safety profile of both analgesic methods by examining their adverse effects, and impact on length of hospital stay.

Materials and Methods: Retrospective Cohort Study done in Armed Forces Hospital for patients underwent elective unilateral TKA surgery under spinal anesthesia between January 1, 2020, and February 29, 2024.

Data including patients demographics, pain score at rest and during movement at 24&48 hours postoperative, medications side affects, frequency of using rescue analgesia(tramadol 50 mg po if VAS score >4), and length of hospital stay in days were all col-

Results and Discussion: A total of 179 patients were analyzed. 91 patients in CFNB group and 88 patients in PAI, there was no statistically significant difference between two groups comparing patient age, weight, gender, side of surgery, ASA physical state and pain scores at rest and during movement at 24 & 48 hours. PAI group shows increased tramadol requirement at 24 and 48 hours post-operation(50mg, 100 mg) respectively while CFNB consumed (0 mg,50 mg)respectively with p value < 0.01.

Our finding support that PAI group has shorter length of hospital admission with mean 5.27 days comparing to 6.26 days in CFNB with P-value < 0.001. Recorded side effects including nausea/ vomiting in 14 patients from PAI and 7 patients CFNB (P value 0.106) and constipation (7 PAI, 6 CFNB) with P-value of 0.78.

Conclusion(s): PIA demonstrates good efficacy in post-TKA pain control, early mobilization (not examined in our finding but evidence showed that CFNB associated with greater risk of quadriceps weakness), cost-effectiveness and ease of use.

Shorter hospital stay makes PIA suitable for Enhanced Recovery After Surgery(ERAS) protocols. It's recommended choice for postoperative analgesia in TKA surgeries.

12AP04-11

Advancements in regional anesthesia: the external oblique intercostal plane block as a game changer in upper abdominal surgery

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Background and Goal of Study: The field of interfascial plane blocks has rapidly evolved, with the transversus abdominis plane (TAP) block serving as a fundamental technique that has sparked numerous derivative regional anesthetic approaches including subcostal TAP variations and the erector spinae block. Current evidence reveals limitations in existing fascial plane block techniques, particularly the subcostal TAP block.

Despite providing moderate analgesia for midabdominal incisions, this approach demonstrates insufficient analgesic potential for surgeries involving lateral abdominal wall such as hepatobiliary surgeries. Initially described by Hamilton et al., the external oblique intercostal plane block (EOIPB) represents an innovative regional anesthetic approach targeting upper lateral abdominal regions.

Clinical studies confirm its effectiveness delivering local anesthetics precisely to intercostal nerve branches across T6/7 to T10/11 segments, providing reliable pain management for lateral and anterior abdominal wall regions.

While 2024 PROSPECT guidelines recommend port-site infiltration or TAP block for laparoscopic cholecystectomy, emerging evidence highlights the EIOPB as a potentially superior regional technique.

The objective of this literature review is to evaluate the current evidence regarding EOIPB for upper abdominal surgeries.

Materials and Methods: We performed a search in the main databases with keywords "external oblique intercostal block" identifying 41 articles. After reading the abstracts 8 RCT were finally selected.

Results and Discussion:

See table, next page.

Conclusion(s): To our knowledge this is the first review published to date related to EOIPB for the perioperative pain management in upper abdominal wall surgeries.

Although existing literature suggests EOIPB may demonstrate potential superior analgesic efficacy, the current evidence remains limited, and further randomized studies are essential to conclusively establish its clinical effectiveness.

Name of first Author	Study Design	Intervention	Control	Anesthesia type/ intraop analgesia	Postop analgesia	Primary Outcome	Secondary outcomes	Differences between groups
Mo, K et al. (Oct. 2024).	RCT. TAP vs. EOIPB for laparoscopic cholecystectomy. N = 49	EOIPB group received UG-EOIPB combined with an RSB (rectus sheath block).	UG-TAP combined with an RS block.	Fentanyl (2 µg/kg), propofol (2–3 mg/kg), and rocuronium (0.1 mg/kg). Paracetamol (1 g) was administered intravenously 30 min before the end of surgery, followed by every 8 h.	1 g paracetamol iv every 8 hours and tramadol (15 mg iv bolus, 15 min locking) with a patient-controlled analgesia (PCA).	Postoperative 24-hour sufentanil consumption.	NRS scores in PACU and at 1, 6, 12, and 24 h postoperatively	The postoperative 24-hour suferitanil consumption in the EOI group was significantly lower than that in the TAP group ($P < 0.01$). Fewer patients in the EOI versus TAP group had a numerical rating score of >3.
Mehmet Selim, Ç et al. (Aug 2024).	RCT. EOIB group vs. oblique subcostal transversus abdominis plane block (Group OSTAP) for laparoscopic cholecystectomy.	For EOIB, 20 mL of bupivacaine, 25% was applied to the tissue plane between the external oblique and intercostal muscles and between the sixth and seventh ribs. N = 36	In the OSTAP block, 20 mL of bupivacaine .25% was applied to the fascia between the rectus abdominis and transversus abdominis muscles. N = 34	2 mg iv midazolam, 2 mg/ kg iv propofol, 6 mg/kg iv rocuronium, and 2 mcg/kg iv fentanyl. Anesthesia was maintained using sevoflurane at MAC 1 and remifentanil.	Perioperatively, 1 g paracetamol iv and 100 mg tramadol iv. As postoperative analgesics, 1 g paracetamol iv every 8 hours and tramadol (without basal infusion, 15 mg iv bolus, 15 min locking) with a patient-controlled an	Postoperative pain was assessed at 1st, 2nd, 4th, 6th, 8th, 12th, 18th, and 24th hours using VAS scores.	(1)Postoperative tramadol consumption was recorded as 0.4, 4-8, 8-16, 16-24 hours time intervals, and 24-hour total values. (2)Time to first analgesic requirement (imitudes), (3)Opioid-related postoperative nausea and vomiting.	There was no statistically significant difference between the groups in terms of postoperative VAS scores or transdol consumption at all time intervals ($P > .05$). The groups did not exhibit any statistically significant variance in terms of 24-hour transdol consumption ($P > .05$). Differences between the groups did not reach statistical significance in terms of time to first analgesic requirement ($P > .05$)
Kavakli, AS. et al. (May 2024).	RCT. EOI block group vs. control group for lapa- roscopic sleeve gastrectomy.	Ultrasound-guided bilateral EOI block with a total of 40 ml 0.25% bupivacaine after anesthesia induction (20 ml each side), N = 28	No intervention. N = 29	Midazolam 0.1 mg kg-1, propofol 2 mg kg-1, and rocuronium 0.6 mg kg-1, in addition to 100 μg of fentanyl. Anesthesia was maintained using sevoflurane at MAC 1 and remillentani. Tramadol 100 mg and paracetamol 1 gr // were also administered for postoperative analgesia.	Bolus of 2 mg IV morphine if the NRS score was greater than 4, and this was repeated every 10 min until the NRS score was below 5. Patients were connected to the intravenous PCA device on discharge from PACU. The PCA device consisted of 0.5 mg mi-1 morphine and was programmed to deliver a bolus dose of 1 mg morphine only on patient demand with a 8-min lockout time and 6 mg 1-1 limit.	IV morphine consumption in the first postoperative 24 h.	Rescue morphine dose in PACU (1); NRS scores in PACU and at 1, 6, 12, and 24 h postoperatively (2); rescue analgesia requirement (3); incidence of postoperative nausea and vomiting (4):	The total cumulative morphine dose in the first postoperative 24 h was lower in patients who received EOI block compared with the control group. Morphine was required by 15 EOI block group patients in the PACU compared to 26 patients in the control group (p=0.002). Postoperative NRS scores at rest were significantly lower in the EOI block group than in the control group at 1, 6, and 12 h (p=0.003, p=0.011, p=0.022, respectively). The postoperative NRS scores during movement were significantly lower in the EOI block group than in the control group until 12 h postoperatively and were then seen to be similar in both groups at 24 h. There were no significant differences between the two groups in respect of postoperative nausea and vomiting (p=0.360, p=0.529, respectively).
Doymus, O. et al (Dec 2023).	RCT. EOI vs. port-site infiltration (PSI) for laparoscopic bariatric surgery		5 ml of 0.25% bupivacaine (25 ml in total) was applied under the aponeurotic layer at each port entry site by the surgeon. N = 27	The same general anesthesis protocol was applied to all patients (not described in the article).	Paracetamol 1000 mg IV was given to each patient 30 min before the end of surgery and repeated every 6 h in the postoperative period. A patient-controlled analgesia device (PCA) was implanted iv in the PACU. The PCA device prepared with fentanyl was programmed with a concentration of 10 mcg/ mi, 15 min locked time, 25 mcg bolus, and no basal infusion and continued for 24 h.	VAS scores during resting at PACU, 1, 2, 4, 8, and 12 h postoperatively.	VAS score in active movement (1): 24-h postoperative fentanyl consumption (2); rescue analgesia (3).	The VAS scores were significantly higher during resting at PACU, 1, 2, 4, 8, and 12 h postoperatively in the PSI group than in the EOI group (p<0.05). The VAS scores were also significantly higher during active movement at PACU, 1, 2, 4, and 8 h postoperatively in the PSI group than in the EOI group (p<0.05). The 24-h postoperative fentanyl consumption was significantly higher in the PSI group (p<0.001). The number of patients requiring rescue analgesia was 14 in the EOI group and 26 in the PSI group (p=0.001).
Gangadhar, V. et al. (Jan 2024).	RCT. Right-sided EOIB + left sided RSB group VS. L1A group for laparoscopic cholecystectomy		LIA group underwent local infiltration at the political properties of the same solution (n=35)	General anesthesia was induced using fentany (2 gugkg), a titrated dose of propofu (2-3 mg/kg), and vecuronium (0.1 mg/kg). The airway was secured with an appropriately sized Proseal larryngeal mask airway. Paracetamol (1 g) was administered intravenously 30 min before the end of surgery, followed by every 8 h.	The time for rescue analgesia was defined as the time from block performance to the first dose of rescue analgesia. Rescue analgesia in the form of tramadol 1 mg/kg intravenously was administered on demand or if the VAS score was 4 or higher.	VAS at 1 h postoperatively.	The secondary outcomes included VAS scores for 24 h, time to first rescue nadipsis, cumulative 24-h analgesia requirement, and patient satisfaction.	that in the LIA group at 1 h, 2 h, 4 h, 8 h, and 12 h (all P < 0.001).
Turunc, E. et al. (Sep 2024).	RCT. Double blinded study. EOI block VS. M-TAPA (Modifed Thoracoabdo- minal Nerve Block Trough Perichondrial Approach) block for laperoscopic cholecystectomy	30 ml of 0.25% buplivaciane was injected into the plane between the external oblique-intercostal muscles between the 6th-7th ribs. The same process was repeated for the other side. N = 30	30 ml of 0.25% bupinecatine was injected into the midclavicular line, between the upper fascial of the transversus abdominsuscle and the lower fascial of the costochondral tissue, at the level of the 9th and 10th ribs. N = 28	Intravenous tramadol 100 mg and IV tenoxicam 20 mg were administered after induction, and IV morphine 0.05 mg/kg was added in the intraoperative period. Intravenous infusion of paracetamol (1 g), and ordansetron (8 mg) was administered 30 min before the end of the surgical procedure.	patients. PCA settings were adjusted: demand dose 20 µg/kg of morphine, lock-out time 8 min, and 4-h limit 80% of the total maximum achievable dose. In cases	Cumulative morphine consumption within the first postoperative 24 h.		In the postoperative 12th and 24th h, there was no statistically significant diference between the groups in terms of morphine consumption. Time to the first opioid demand from PCA, and number of patients using rescue analgesia and antiemetics were similar between the two groups (p>0.05). There were no significant differences between the groups in postoperative NRS resting/activity pain and PCNV scores at all measurement points. When considering the total CoR-15 scores of the groups, it was observed that the pre-operative, postoperative 1st day, and discharge scores were similar in both groups.
Suzuka, T. et al. (Jul 2024).	RCT. EOIB vs. Wound infiltration for laparoscopic gastrectomy	Following anesthesia induction, 20 mL of 0.25% levolupivacaine per side (total 40 mL). N = 15	The surgeon administered 40 mL of levobupivacaine (0.25%) to the peritoneum, fascia, and subcutaneous tissue via five port holes using a 23 gauge short needle before closure. N = 17	All participants underwent general anesthesia with 15-2 mg/kg propordi and 0.9 mg/kg rocuronium, fentanyl, and remilientanil for induction and were maintained with sevoflurane, remilientanil, and fentanyl, and return the proposition of the proposition of the proposition of the participant of the p	Patients received intravenous fentaryl patient-controlled analgesia with a fentaryl concentration of 0.5 µg/kg/mL, no basal flow, a bolus 1 mL on demand, and a 10-min lock-out interval.	Numeric rating scale (NRS) score 12 h after surgery.	NRS scores at 2 h postoperatively and on postoperative days (POD) 1 and 2 (1) postoperative days (POD) 1 and 2 (1) postoperative florations in quality of recovery (OGR-15 scores from preoperative baseline to POD 1.2, and 7 (3), and variations in World Health Organization Disability Assessment Scale 2 (D WHODAS 2.0) scores between baseline and 3 months post-surgery (4).	No differences in the NRS scores 12 h postoperatively at rest and during movement between the two groups: EOIB vs. WI. There were no significant differences in any of the secondary outcomes between the two groups, including postoperative fentanyl consumption and WHODAS 2.0 scores.
Korkusuz, M. et al (Oct 2023).	RCT. Laparoscopic cholecy- stectomy. EOIB vs. standard multimodal analgesia for laparoscopic cholecystectomy.	bupivacaine into	No block group (standard multimodal analgesia), N = 40	For anesthesia induction, intravenous propolo 2 mg/ kg, nocuronium 0.6-1 mg/ kg, nocuronium 0.6-1 mg/ kg and fentanyl 1-2 µg/ kg were used. Anesthesia was maintained using remilentanti infusion and sevoflurane at a concentration of 0.8-1 minimum alwolar. Remifentanil was administered at a rate of 0.01-0.2 µg/kg/min. Tramadol 1 mg/kg was administered just before the remifentanil infusion was ended.	For postoperative analgesia, all patients were given dexketoprofer (50 mg) twice a day and paracetamol (1 g) 4 times a day with equal intervals between doses. The first application of analgesic drugs was administered after anesthesia induction.	Tramadol consumption at postoperative 24 hours.	Numeric Rating Scale (NRS) scores (1), postoperative Quality of Recovery score (OR-15) (2), sedation score (3), the incidence of nausea and vomiting (4), and antiemetic consumption (5).	The median (Q1, Q3) tramadol consumption at 24 hours was significantly lower in EOIPB group than in control group (p<0.001). The NRS values in EOIPB group were statistically significantly lower from the 15th minute to the 24th hour, both during rest and motion, compared to the control group. Regarding QoR-15 scores, the EOIPB group was determined to have significantly higher median scores (p<0.001). Throughout all time points analyzed, both study groups' sedation and PONV scores showed no significant difference (p<0.05). There was no variation in the groups in terms of consumption of metoclopramide.

12AP05-1

Recognizing and managing cerebrospinal fluid cutaneous fistulas: a case report

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Background: Neuraxial techniques are considered the gold standard in obstetric anesthesia, for both labor analgesia and cesarean section.

Cerebrospinal fluid (CSF) cutaneous fistula is a rare complication of these procedures. As such, diagnosis may be delayed and specific management recommendations are lacking.

Case Report: A 35-year-old woman, ASA II, G2P1, at 39 weeks gestation, underwent a cesarean section due to failure of labor progression. A combined spinal-epidural was performed at first attempt, using an 18G Tuohy and 27G spinal needle. The surgical procedure was uneventful, and postoperative pain was managed with epidural morphine boluses.

On postoperative day 3, a few hours after the removal of the epidural catheter, a clear fluid drainage was noted through the puncture site. The patient was asymptomatic, with no signs of post-dural puncture headache or meningeal irritation. A quick glycemic test confirmed the presence of glucose, which suggested the diagnosis of a CSF cutaneous fistula.

After discussing the case with the Neurology and Neurosurgery Teams, the puncture site was sutured, and the patient was advised to maintain hydration and bed rest. No further leakage was observed

The patient was discharged on postpartum day 4, with no additional complications.

Discussion: When clear fluid is draining from the epidural site, it is important to differentiate between CSF, interstitial fluid and local anesthetic. Glucose tests provide a quick way of diagnosing CSF leakage and can guide management while awaiting definitive results from beta-2 transferrin or beta-trace protein testings.

Factors that may delay healing at the puncture site include immune compromise, multiple puncture attempts and the use of epidural steroids. Asymptomatic patients can often be effectively treated with minimally invasive measures such as suturing the epidural site, hydration and bed rest.

While some studies suggest using antibiotic prophylaxis to prevent meningitis, evidence is limited.

Reference:

Tsai A, Ahmed S, Wang J. Persistent cerebrospinal fluidcutaneous fistula after epidural analgesia: a case report and review of literature. Journal of Anesthesiology and Clinical Science, 2014

Learning Points: Anesthetic and obstetric teams should be mindful of this rare but possible complication associated with neuraxial techniques. This case highlights the effectiveness of conservative and minimally invasive approaches as reliable treatment options for CSF cutaneous fistula.

12AP05-2

Crystallization and pharmacological stability of local anesthetics in mixtures with dexamethasone for perineural administration

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Background and Goal of Study: Perineural administration of dexamethasone is unauthorized and may increase the risk of crystallization. However, it is often used as an adjuvant in regional anesthesia. In our study, we sought to investigate whether the severity of crystallization of different anesthetics remains the same when dexamethasone is added, what factors influence this process, and whether new compounds are formed during mixing.

Materials and Methods: The study evaluated the crystallization and pharmacological stability of the combination of local anesthetics with dexamethasone, using light microscopy, pH measurement and HPLC.

Results and Discussion: The crystallization process was more evident in the samples with 0.33% levobupivacaine, and the crystal sizes ranged from 37 to 108 µm, significantly exceeding the crystallization process in the samples with 0.33% ropivacaine (Fig.1). The study supported the hypothesis that there is a correlation between the crystallization process and hydrogen index (pH) level of the solution (Table 1). Calculations of the degree of separation according to the formula used Rs=2xa/(W-1+W-2) showed that the partition coefficients of dexamethasone with ropivacaine and levobupivacaine are 2.0 and 4.1 respectively, indicating complete separation of the drugs without chemical reaction since the partition coefficient >1.0.

Conclusion(s): Our study demonstrated that HPLC analysis did not reveal new compounds or structural changes from the medication source. Crystallization of local anesthetics with dexamethasone is pH-dependent: initial lower pH values lead to more evident crystallization.

Drugs and their mixtures	pH (22°C)	pH (37°C)
Dexamethasone p.	7,79	
Ropivacaine 0.33%	6,26	
Levobupivacaine 0.33%	5,59	
Ropivacaine 0.33%+dexamethasone 40% (20:2)	6,79	6,3
Levobupivacaine 0.33%+dexamethasone 40% (20:2)	6,70	6,4

Table 1. The hydrogen index of solutions of local anesthetics and their mixtures with dexamethasone.





Figure 1.

- a. 0.33% solution of ropivacaine and dexamethasone ×200;
- b. 0.33% solution of levobupivacaine and dexamethasone ×200

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12AP05-3

The effectiveness of transverse abdominis plane block for postoperative pain management after category one emergency cesarean section with general anesthesia

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Background and Goal of Study: The PROSPECT recommends transverse abdominis plane block (TAPB) as a postoperative pain method after cesarean section (C-section) under spinal anesthesia with intraoperative paracetamol and non-steroidal anti-inflammatory drugs (NSAIDs) [1].

However, there is no evidence for pain management for category one emergency C-sections with general anesthesia, which are highly urgent situations for surgical delivery.

Our retrospective research examined the effectiveness of postoperative pain relief after ultra-urgent C-section with or without TAPB under a multimodal analgesia regimen.

Materials and Methods: We collected the medical records of the category one emergency C-sections under general anesthesia from April 2012 to October 2024. All patients received a patientcontrolled intravenous analgesia (IV-PCA) with fentanyl, a regular prescription of paracetamol and NSAIDs, in addition to a rescue analgesia under a multimodal analgesia regimen. Patients were divided into two groups: those with TAPB after surgery (TAP; n = 17) and those without (no TAP; n = 23).

Outcome measures of group comparison were postoperative pain scores, number of requests for and time to first use of postoperative supplemental analgesics, and time to completion of postoperative ambulation.

Results and Discussion: The postoperative NRS pain score at one hour after C-section was 2 [0-6] in TAP and 3 [0-7] in no TAP (p = 0.045); however, there was no difference in the other time points. The time to first use of supplemental analgesics was not different; otherwise, the achievement time for ambulation was significantly earlier in patients who received TAP (32 hours in no TAP v.s. 23 hours in TAP; p = 0.007).

The effectiveness of TAPB is limited only to somatic pain, and the systemic administration of opiate, paracetamol, or NSAIDs suppresses painful uterine contraction.

Conclusion: It is possible to achieve early postoperative pain relief and early ambulation by a multimodal analgesia regimen and performing a TAP block after a category one emergency C-section. Ultra-emergency cesarean section is a rare and time-sensitive procedure; therefore, it isn't easy to conduct prospective studies; however, evidence can be obtained by accumulating data.

References:

1. Roofthooft E, et al. PROSPECT guideline for elective caesarean section: updated systematic review and procedurespecific postoperative pain management recommendations. Anaesthesia. 2021;76:665-680.

12AP05-4

Fascia iliaca plane block - an anesthetic alternative

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Background: Peripheral regional anesthesia oftentimes is a helpful alternative in high-risk patients, where general and neuraxial anesthesia can cause severe complications. Fascial plane blocks (FPB), like the fascia iliaca (FIPB), are a specific kind of peripheral block where the target of injection is the plane between fascial lavers in which certain nerves run.

Typically FPB are used as an analgesic technique, but they can also be successfully applied as an anesthetic strategy, avoiding general and neuraxial anesthesia. The FIPB can be performed above or below the inguinal ligament and consists in the injection of a large volume of local anesthetic in the iliac fascia that disperses and blocks the femoral and lateral femoral cutaneous nerves.

Case Report: This case depicts a 78-year old male who presented to the ER with sudden intense pain on his leg. He had a history of severe peripheral artery disease already subjected to multiple surgeries and was diagnosed with critical limb ischemia. He was also hemodynamically unstable and bradycardic (30 bpm) and his ECG showed a previously unknown 3rd degree AV block. He underwent emergency pacemaker implantation before going to the OR for a femoral thromboembolectomy, despite maintaining cardiogenic shock with need of aminergic support with noradrenaline and dobutamine.

We opted for an US-guided suprainguinal approach FIPB with 40mL of ropiyacaine 0.375%, verifying good dispersion. Total anesthesia of the surgical territory was achieved, without need for surgical local anesthesia.

A small infusion of propofol was maintained for patient comfort (BIS 80). The surgical procedure was performed successfully. and the patient maintained the same hemodynamic status.

Discussion: Our goal with this case report is to share the usefulness of FPB in solving anesthetic conundrums, where general and neuraxial anesthesia are contraindicated or could be related with severe complications.

In this case, the suprainguinal approach to the FIBP proves to be a successful alternative for procedures of the anterior thigh, such as the femoral thromboembolectomy.

References:

Chin KJ, Versyck B, Elsharkawy H, et al. Anatomical basis of fascial plane blocks. Regional Anesthesia & Pain Medicine 2021;46:581-599.

https://acesse.dev/nysora-fipb

Learning Points: FPB are a useful anesthetic alternative in high risk patients for some surgical procedures; Suprainguinal fascia iliaca plane block is an option for femoral thromboembolectomy.

12AP05-5

Gastrostomy tube insertion under ultrasound-quided bilateral rectus sheath and external oblique intercostal plane blocks in a patient with glottic squamous cell carcinoma and superior vena cava syndrome - a case report

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Background: Larvngeal carcinoma can cause oral obstruction requiring gastrostomy tube placement. In addition to airway complications, co-morbidities like superior vena cava syndrome may lead to cardiovascular collapse during anesthetic management. A gastrostomy was successfully performed using ultrasound-guided peripheral nerve blocks.

Case Report: A 61-year-old male with laryngeal carcinoma, posttracheostomy and total laryngectomy, presented with poor oral intake and facial swelling. He was high-risk for general anesthesia and declined certain life-sustaining measures. The patient was placed in the supine position with a size 5 endotracheal tube inserted via the tracheostomy.

Bilateral rectus sheath blocks (RSB) and external oblique intercostal (EOI) blocks were administered under ultrasound guidance using an in-plane approach.

Incremental doses of 0.25% Bupivacaine (20 mL for RSB and 24 mL for EOI) were injected. Sedation was achieved with Sevoflurane at a MAC of 0.8-1, maintaining spontaneous ventilation. The procedure was successfully completed.

Discussion: The gastrostomy was necessary for nutritional support as part of palliative care. General and spinal anesthesia were avoided to minimize the risk of hemodynamic instability and cardiovascular collapse.

RSB provided somatic anesthesia to the anteromedial abdominal wall, effectively managing incisional pain, EOI blocks supplemented this by targeting retraction pain from the anterolateral abdomen (T7-T11 dermatomes).

These blocks reduced anesthetic requirements and postoperative pain medication needs, making them suitable alternatives in critically ill patients.

References:

- 1. Cocks, H., et al. "Palliative and Supportive Care in Head and Neck Cancer: UK National Multidisciplinary Guidelines." The Journal of Laryngology & Otology, 2016, pp. S198-207.
- 2. Shamim, F., et al. "Palliative Surgical Gastrostomy under Ultrasound-Guided Bilateral Rectus Sheath Blocks." Saudi Journal of Anaesthesia, 2018, pp. 371-71.
- 3. Muhammet, K., et al. "Bilateral External Oblique Intercostal Plane Block in Patients Undergoing Laparoscopic

Cholecystectomy." Saudi Medical Journal, 2023, pp. 1037-46.

Learning Points: RSB and EOI blocks are effective analgesic techniques for anterior abdominal surgeries in high-risk patients, reducing the likelihood of major cardiovascular and respiratory complications.

12AP05-6

Ultrasound-guided nerve block from 1994 to 2024: a bibliometric and visualization perspective

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Background and Goal of Study: Ultrasound-guided nerve block (UGNB) has witnessed three decades of development and significant advancements

This article is to review the evolution of UGNB, identify current research hotspots, and outline future developmental prospects for the global research community.

Materials and Methods: We selected original articles and reviews related to UGNB from the WoSCC database. Utilizing tools including VOSwiewer, CiteSpace, the "bibliometrix" package in R, and the online platform (https://bibliometric.com/), we conducted a comprehensive analysis and visualization of data encompassing general information, countries, organizations, authors, references, keywords and trend topics.

Results and Discussion: Our analysis included 3,271 papers published by 11,768 authors across 620 journals from 1994 to Oct 2024. UGNB-related research continues to be a hot topic, with a sustained interest expected in the foreseeable future.

North American and European countries, particularly the USA, lead in this field. The University of Toronto stands out among various organizations. ILFELD BM, MARIANO ER, and MARHOFER P are identified as the top three most influential authors. "REGION-AL ANESTHESIA AND PAIN MEDICINE," with the highest number of publications, citations, and H-index, emerges as the leading journal in the UGNB domain.

The papers by LOEB S (2013) in "EUR UROL" and FORERO M (2016) in "REGIONAL ANESTHESIA AND PAIN MEDICINE" are the most cited and co-cited works.

Continuous hotspots include modified radical mastectomy combined with UGNB, enhancing the quality of UGNB, erector spinae plane block, and the use of adjuvants.

Conclusion(s): UGNB remains a vibrant area of research. Organizations, journals, and authors from North America and Europe are at the forefront.

Future research directions are likely to focus on expanding applications to various surgical procedures, technological innovations, and strategies to improve the quality of anesthesia.

12AP05-7

Anaesthetic challenges in a case of Uremic Leontiais Ossea for left cephalic vein pseudo aneurysm rupture repair

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Background: A rare case of uremic leontiasis ossea with end stage renal disease (1) came for repair of pseudoaneurysm of left cephalic vein. This case is unusual because of difficult airway due to dysmorphic facial structure. We did this case under left infraclavicular block, (2) using peripheral nerve stimulator.

Case Report: 37yr old female patient with chronic kidney disease on hemodialysis, tertiary hyperparathyroidism with facial deformity, was taken up for surgery. Patient had AV fistula which now developed rupture of pseudo aneurysm of left cephalic vein.

Airway examination showed maxillary and mandibular hyperplasia with decreased mouth opening to less than 3cm, flattened nasal bridge and increased interdental spacing. Labs showed serum creatinine 2.1mg/dl and serum PTH 4310pg/ml.

After obtaining high risk consent, patient was given left infraclavicular block with PNS guidance, with 20 ml of 0.5 percent levobupivacaine at current threshold of 0.4 mA. Awake fibre optic cart with difficult airway and ENT surgeon for tracheostomy was kept standby. Case was done successfully without any periprocedural complications.



Discussion: Uremic leontiasis ossea is a rare condition that occurs with renal failure on hemodialysis with secondary hyperparathyroidism characterized by widening of nares, flattened nasal bridge, maxillary and mandibular hyperplasia.

We are reporting first time this condition done under regional anaesthesia, infraclavicular block for psedonaurysm rupture repair. Infra clavicular block is a phrenic nerve sparing block for surgeries for mid arm and forearm.



References:

1. Abhinava RJ. et al.Indian J Anaesthesia.2017Jul:61(7):581-586 2. G Yang, et al. Osteoporos Int. 2014 Mar;25(3):1115-21 Learning Points: The uremic leontiasis ossea is a rare difficult airway case. A phrenic nerve sparing block like infra clavicular block can be done for mid arm surgery.

12AP05-8

Comparison of analgesic efficacy of levobupivacaine with or without fentanyl in thoracolumbar inter-fascial plane block in adults undergoing elective lumbar spine surgery: a randomized control trial

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Background: Posterior lumbar spine fusion surgeries are associated with significant postoperative pain, necessitating a multimodal approach to pain management. The thoracolumbar interfacial plane (TLIP) block is a relatively new regional anesthesia technique being investigated for its analgesic efficacy in lumbar spine surgeries.

Objective: This study aimed to compare the analgesic efficacy of levobupivacaine (LB) with and without fentanyl as an adjuvant in TLIP blocks for adults undergoing elective lumbar spine surgery. Secondary objectives included evaluating total tramadol consumption over 48 hours postoperatively (when Visual Analog Scale [VAS] > 4) and recording any associated side effects.

Methods: A prospective, randomized controlled trial was conducted at AIIMS Raebareli between August 2023 and November 2024. The trial was registered in the Clinical Trials Registry-India (CTRI REF 2024/05/085604) on 30/05/2024. A sample size of 45 participants per group was determined based on statistical calculations and prior research. Patients undergoing lumbar spine fixation surgery (up to two levels) were randomized into two groups:

- Group A: Received 20 mL of 0.25% LB + 1 mL normal saline (NS).
- Group B: Received 20 mL of 0.25% LB + 1 mL fentanyl.
- Both groups received bilateral TLIP blocks preoperatively.

Results: Group B demonstrated significantly lower postoperative VAS pain scores, both at rest and during movement, compared to Group A. The time to first rescue analgesia was significantly prolonged in Group B (442.7 \pm 126.47 minutes vs. 321.00 \pm 69.01 minutes, P < 0.001).

Additionally, Group B had significantly reduced cumulative tramadol consumption in the first 48 postoperative hours.

Conclusion: The addition of fentanyl as an adjuvant to levobupivacaine in TLIP blocks provides superior analgesia, with a longer pain-free duration, delayed requirement for rescue analgesia, and reduced total rescue analgesic consumption in patients undergoing elective lumbar spine surgeries.

References:

1. https://statulator.com/

2. Narang D, Kumar G. Comparative Study Between Bupivacaine Alone and Bupivacaine with Fentanyl in Axillary Plexus Block for Upper Limb Surgeries. Ann. Int. Med. Den. Res. 2019; 5(1):AN01-AN05.

12AP05-9

Ultrasound-assisted neuraxial anesthesia: a safe approach in ankylosing spondylitis

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Background: Ankylosing spondylitis is a chronic inflammatory arthritis that primarily affects the axial skeleton and sacroiliac joints. In severe cases, this causes ossification of axial ligaments and vertebrae fusion, resulting in the formation of a classical "bamboo spine".

This presents a challenge for anesthesiologists due to the potential for a difficult airway, respiratory and cardiovascular complications, and a challenging neuraxial access.

Case Report: A 56-year-old male was proposed for an elective left total hip replacement surgery. The patient had ankylosing spondylitis, grade 1 obesity and hypertension. On physical examination, the airway was anticipated to be difficult due to the lack of cervical mobility. A spinal anesthesia by the conventional blind technique had previously been attempted without success.

Therefore, we decided to perform an ultrasound examination of the lumbar spine using a low-frequency (2-5 MHz) curved transducer. The spine was scanned from the sacrum level upwards in the transverse midline plane and parasagittal planes on both sides.

We were able to establish landmarks by visualizing the L3-4 and L4-5 intervertebral levels, the midline and measuring the depth of the posterior limit of the intrathecal space.

Dural puncture was successfully achieved using a 25-gauge Whitacre needle, and 11 mg of levobupivacaine and 0.002 mg of sufentanil (total volume of 2.6 mL) were administered intrathecally. The motor and sensory blocks were deemed adequate, and the surgery proceeded without complications.

Discussion: Ultrasound-assisted neuraxial anesthesia can be a useful tool when technical difficulty is anticipated, such as in patients with ankylosing spondylitis.

Comparing with the conventional method, this approach enhances clinical accuracy by anticipating the feasibility of a central neuraxial blockade and can improve patient safety. This enables

anesthesiologists to offer regional anesthesia as an alternative to general anesthesia for patients with abnormal spinal anatomy who would also benefit from a regional approach.

References:

1. BJA Education, 16 (7): 213–220 (2016) 2. Anaesthesia, 64: 540-548 (2009)

Learning Points:

- Ankylosing spondylitis presents a challenge since both airway management and neuraxial access may prove to be difficult.
- Neuraxial ultrasound can be a valuable tool in patients with ankylosing spondylitis as it enables the anesthetist to offer regional anesthesia as an alternative to general anesthesia.

12AP05-10

Urgent decision-making: to remove or maintain an epidural catheter in patient with acute pulmonary embolism (PE)

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Background: According to the ESC guidelines, Pulmonary Embolism (PE) is one of the leading causes of cardiovascular death. Some risk factors for PE include knee arthroplasty, immobilization, hypertension and obesity.

Therefore, it is a comorbidity to consider in the postoperative period of major orthopedic surgery. Early prevention, diagnosis, and treatment are crucial.

Case Report: A 68-yo female patient, ASA II, with a history of hypertension and obesity underwent knee arthroplasty. On day 3 post-op, she was on prophylactic enoxaparin and receiving PCEA. Patient was found after a syncopal episode associated with desaturation and hypotension. After airway stabilization and oxygen administration, the patient regained consciousness with improved blood pressure.

Following stabilization, Troponin I, NT-proBNP, 12-lead EKG, transthoracic echocardiography, and pulmonary CT angiography were ordered and revealed bilateral PE with right ventricular dilation and mild dysfunction. In this context, a multidisciplinary team decided to remove the epidural catheter and initiate enoxaparin 1 mg/kg 1 hour after catheter removal, given the intermediate-highrisk PF.

Patient was transferred to the Intensive Care Unit (ICU) where she was monitored by the acute pain unit for new neurological changes and hemodynamic stability. Patient was discharged from the ICU 5 days after and from the hospital 15 days later, without sequelae of PE and without neurological deficits.

Discussion: The urgent initiation of anticoagulation in a patient with an epidural catheter is an infrequent situation for which there are no concrete management guidelines. In this case, it was decided to remove the epidural catheter before initiating anticoagulation to minimize the risks associated with an *in situ* catheter for an indeterminate period in a patient who would require anticoagulation for at least 3 months.

According to the ESAIC guidelines, anticoagulation should not be initiated in a patient with an *in situ* epidural catheter.

After a multidisciplinary discussion, the risk of epidural hematoma was assumed in a patient with intermediate-high-risk PE due to the potential life-threatening risk, while maintaining close monitoring.

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References:

- 1. Konstantinides S et al. Eur Heart J. 2020;41(4):543-603.
- 2. Kietaibl S et al. Eur J Anaesthesiol, 2022:39:100-13

Learning Points: Postoperative Pulmonary Embolism: Multidisciplinary Approach to Complex Clinical Scenarios; Importance of Close Monitoring.

12AP05-12

Retrospective investigation of the anesthetic effectiveness of combined intersalene brachial plexus, superficial cervical plexus, and clavipectoral fascia plane blocks in anesthesia and analgesia management of clavicle fractures under ultrasound guidance

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Background and Goal of Study: Various regional anesthesia techniques are used for anesthesia and analgesia in clavicle surgery. In this study, the anesthetic effectiveness of combined Interscalene Brachial Plexus (IBP), Superficial Cervical Plexus (SCP), and Clavipectoral Fascia Plane Blocks (CPFPB) performed under ultrasound guidance for clavicular surgery was investigated retrospectively.

Additionally, this study aimed to determine whether there are significant differences in the amount of anesthetic used for peripheral blocks and the return times of pain sensation and motor block based on the type of peripheral block.

Materials and Methods: This study was planned to investigate the quality of anesthesia, analgesia, and motor block in patients undergoing combined IBP, SCP and CPFPB at kHSU through a retrospective review of records. The study group consisted of patients who underwent interscalene block, superficial cervical plane block, and clavipectoral fascia plane block together under ultrasound guidance.

The study included ASA I-III patients aged 18-80 years who were diagnosed with clavicle fractures by orthopedics and underwent clavicle surgery, receiving Interscalene Brachial Plexus, Superficial Cervical Plexus, and/or Clavipectoral Fascia Plane Blocks. The data of the included patients were planned to be compiled by retrospectively reviewing their anesthesia and pain monitoring

Results and Discussion: When the demographic data of both groups were analyzed, no statistically significant difference was found (p>0.05). When both groups were evaluated regarding intraoperative sedation needs, no statistically significant difference was identified. However, significant differences were found for VAS2, VAS4, and VAS24.

Conclusion(s): CFPB has additional advantages compared to combined plexus blocks. Its use in clavicle fracture surgeries for providing analgesia and anesthesia has started to be recommended, and the number of studies on this topic is increasing day

However, the lack of randomized controlled trials indicates a need for more research to propose CFPB over brachial and cervical plexus blocks.

Our study is one of the few that evaluates the anesthetic and analgesic efficacy of CFPB in combined blocks.

References:

1. Sonawane K, Dharmapuri S. Awake Single-Stage Bilateral Clavicle Surgeries Under BilateralClavipectoralFascia Plane Blocks: A Case Report and Review of Literature. J. Cureus. 2021 20:13(12):e20537

12AP06-1

Pericapsular nerve group block in shoulder surgery: a case report

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Background: As part of a multimodal pain management, regional anesthesia has its role well established in shoulder surgery, with the interscalene brachial plexus block being one of the main preferences among anesthesiologists. However, in patients with reduction of pulmonary reserve, the interscalene approach raises concerns about the diaphragmatic hemiparesis that may occur, leading to potential respiratory postoperative complications.

A pericapsular nerve group (PENG) approach has been described as a safe and effective option. 1

Case report: A 68-year-old male patient was admitted in the emergency department due to a fall from own height. He had a proximal left humerus fracture with surgical correction criteria, with no other injuries to report. A proposal for an open surgical reduction was made.

During the planning of the anesthetic approach, in the preoperative evaluation, the anesthetic team realized the patient suffered a severe restrictive ventilatory syndrome due to kyphoescoliosis, aggravated by a history of COPD owing to heavy smoking habits. On arrival to the OR, he was conscient and orientated, with no signs of respiratory difficulty, with peripheric O2 saturation of 90-

The patient was proposed to a combined anesthesia technique. In order to avoid potential respiratory postoperative complications due to diaphragmatic hemiparesis associated with regional techniques, a shoulder PENG approach was planned. The blockade was performed before anesthetic induction, ultrasound guided, with 100 mg of ropivacaine.

Surgery went uneventful. In the postoperative period, no pulmonary complications were reported and the patient had satisfactory analgesic control. He was discharged in the next day.

Discussion: Pain management strategies related to shoulder pain following surgery are crucial to early patient recovery. PENG block may be safely and effectively applied as a part of a multimodal analgesic regimen for shoulder surgery by blocking the articular branches of the glenohumeral joint.

Additional studies might be needed in order to better understand the technique and its benefits in comparison with other options.

Reference:

1. İlkeKüpeli, MerveYazici Kara, Anesthesia or analgesia? New block for shouldersurgery: pericapsular nerve group block, Brazilian Journal of Anesthesiology(English Edition), Volume 72, Issue 5,2022,Pages 669-672,ISSN 0104-0014;

12AP06-2

Suprascapular and supraclavicular brachial plexus block as a successful anesthetic plan in a patient with neck radiation: a case report

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Background: The management of patients with previous head and neck radiotherapy poses unique anesthetic challenges due to radiation-induced tissue fibrosis, resulting in limited mouth opening and restricted cervical mobility1.

This case is noteworthy as it illustrates the successful use of regional anesthesia (RA) in previously irradiated tissue of a patient with predicted difficult airway, avoiding the risks associated with general anesthesia. This unusual combination of conditions has no pair in the scientific literature, being the only case of this nature to be described.

Case report: A 75-year-old female, ASA III, with a complex medical history, including a prior base of tongue carcinoma treated with radical neck dissection and radiotherapy, was scheduled for open reduction and osteosynthesis of a proximal humerus fracture. Physical examination revealed severe neck fibrosis and limited mouth opening, suggesting a difficult airway. Given these findings, RA was chosen. A supraclavicular brachial plexus block was combined with a suprascapular nerve block, with dexmedetomidine for conscious sedation. The procedure was successful, and the patient was discharged on postoperative day two, requiring no opioids by day 15.

Discussion: This case underscores the effectiveness of a tailored RA approach for shoulder surgery in patients with radiation-induced tissue fibrosis. Literature supports the safety and efficacy of suprascapular and supraclavicular blocks for pain management, particularly in patients where traditional interscalene blocks may pose risks, such as phrenic nerve palsy or altered anatomy due to fibrosis^{2,3}.

This report aims to highlight RA as a viable alternative in similar high-risk cases.

References:

- 1. Nepon, H., et al. Radiation-Induced Tissue Damage: Clinical Consequences and Treatment. Semin Plast Surg, 2021.
- 2. Fredrickson, M. J., et al. Postoperative Analgesia for Shoulder Surgery. Anaesthesia, 2010.
- 3. Toubasi, A., et al. Continuous Suprascapular Catheter and Axillary Block for Analgesia in Shoulder Arthroplasty. Cureus, 2023.

Learning points:

- 1. RA, particularly suprascapular and supraclavicular blocks, can mitigate the risks of airway compromise in patients with head and neck radiation sequelae.
- 2. RA is safe and effective in patients with radiation-induced tissue fibrosis.
- 3. This case supports RA as an effective alternative to general anesthesia in complex patients, enhancing comfort and minimizing opioid reliance.

12AP06-3

Comparison of the efficacy of intrathecal morphine, ultrasound-guided erector spinae plane block with PCA fentanyl in the control of post-operative pain after modified radical mastectomy: a randomized controlled trial

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Background and Goal of Study: Breast cancer is the most common cancer in females and modified radical mastectomy (MRM) is the surgical procedure of choice. Regional analgesia techniques help in reducing acute postsurgical pain. We wanted to ascertain which regional technique viz. intrathecal morphine (ITM), ultrasound-guided erector spinae plane block (ESPB), as compared to conventional general anaesthesia (GA) control group was more effective in relieving pain after MRM.

Primary objective included:

- 1. PCA fentanyl consumption in 24-hour postoperative period. Secondary Objectives included:
- 1. Time to first analgesic requirement after end of surgery.
- 2. Assessment of post-operative pain using a 0-100mm Visual analogue scale (VAS) with patient at rest and on abduction of ipsilateral arm above the head
- 3. Incidence of adverse events (post-operative nausea, vomiting, respiratory depression, pruritus and urinary retention).
- 4. Patient satisfaction score

Materials: Type of study - Single blind randomized controlled trial. Place of study: Department of Anaesthesiology, Pain Medicine and Critical Care, All India Institute of Medical Sciences, New

Methods: 60 ASA grade I & II patients scheduled to undergo MRM under GA were randomly allocated to either ITM, ESPB or control group. Patients received conventional GA and postoperative PCA IV fentanyl.

Results and Discussion: The 24-hour post-operative fentanyl requirement was comparable between ITM and ESPB groups (p= 1.0000). Fentanyl consumption was significantly more in control group as compared to ESPB group (p= 0.0467). Time to first analgesia was longer in ESPB group with a mean duration of 2.605 (0-5.03) hours [median (range)]. Nausea was significantly more in ITM group (p=0.039).

Conclusion(s): ESP block was associated with significantly lower post-operative 24-hour PCA fentanyl consumption. ITM was accompanied by a high incidence of post-operative nausea.

12AP06-4

Retroclavicular approach of infraclavicular brachial plexus block for regional anaesthesia for upper limb surgeries: a systematic review and meta-analysis

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Background and Goal of Study: Retroclavicular block (RCB) is an alternative approach of infraclavicular block (ICB) of the brachial plexus for upper limb (UL) surgeries. The objective of the analysis was to assess the feasibility, efficacy and safety outcomes in adult patients undergoing UL surgeries under the RCB versus other brachial plexus blocks (BPBs).

Materials and Methods: Search was carried out from MEDLINE. EMBASE, SCOPUS and manually from inception to November 1, 2023. Randomized controlled trials comparing RCB to other BPBs were included. Studies including administration of block via landmark or nerve stimulator guidance, paediatric population or under general anesthesia were excluded. The quality of evidence was assessed using Cochrane Revman risk of bias (ROB) tool.

The primary outcomes were adequate surgical anesthesia from the block alone and the block performance time (BPT).

Secondary outcomes were block onset time - sensory and motor, number of attempts, duration of block and any complications. Results and Discussion: Nine trials (n=742, RCB=360, Others=382) were included. Block success rate was similar in all the blocks (Risk ratio (RR) 1.02; 95% confidence interval (CI) 0.98, 1.07; p=0.23, moderate quality of evidence (QOE)).

No significant difference was seen in needling time (Standardised mean difference (SMD) -0.26; 95% CI -0.89, 0.36; p=0.41), BPT (needling and imaging time) (SMD = -0.36; 95%CI -1.23, 0.51, p=0.41), pain during procedure (SMD =-0.39; 95%CI -0.94, 0.15, p=0.16) and complications (RR 0.56: 95% CI 0.23, 1.40, p=0.22). The needle visibility was significantly better in RCB (M.D. 1.14: 95%CI 0.80, 1.49, p<0.00001). The QOE for all these outcomes was low. In the RCB approach, the needle insertion point being posterior to the clavicle, allows an almost perpendicular alignment of the ultrasound beam and needle shaft leading to an enhanced needle visibility. This was consistent in our results.

However, this did not equate to better needling time with RCB. Moreover, needling time was defined differently in all studies which could have led to inconclusive results and high heterogeneity in the pooled analysis. Limitations of the analysis are smaller number of studies and heterogeneity in the block drug and volume used.

Conclusion: The retroclavicular approach of ICB, though showing better needle visibility, was not found to be superior or inferior to other BPBs in terms of needling time, BPT, success rate or complications.

12AP06-5

Successful supraclavicular block for diabetic patient with traumatic injury in the emergency department

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Background: Patients presenting to the emergency department (ED) often experience significant pain. Regional anesthesia (RA) is increasingly used in these settings, providing effective and safe pain control, especially in patients with multiple comorbidities.





Case report: A 51-yo male ASA III, presented to the ED with a penetrating trauma to the right forearm caused by a wooden board. Patient had a history of poorly controlled type 1 diabetes mellitus. In ED the patient was monitored with ECG, pulse oximetry, and non-invasive blood pressure.

He was conscious, maintaining a patent airway with spontaneous breathing and hemodynamically stable. He reported severe pain but had no sensory or motor deficits. Considering the patient had a 5h fasting period, a RA strategy was chosen for urgent wound cleaning, foreign body removal and debridement. 20 minutes after admission, a ultrasound-guided supraclavicular brachial plexus block was performed administering 20 ml of 2% mepivacaine after negative aspiration and without sensory complaints.

The block provided effective anesthesia within 5 minutes, allowing for the procedure without any sedation. Patient was admitted for inpatient care, prescribed intravenous analgesia and referred to the acute pain unit. 12h post-procedure, patient reported 0/10 pain on NRS at rest and with movement, with no new sensory or motor deficits.

Discussion: This case highlights the efficacy and safety of RA in managing pain for complex procedures in high-risk patients in ED.

In a patient with a risk of a full stomach, RA proved to be an effective and safe strategy, not only provided sensory anesthesia for the procedure but also effective analgesia in the initial hours. **Reference:**

Wolmarans, M., & Albrecht, E. (2023). Regional anesthesia in the ED. *Curr Opin Anaesthesiol*, 36(4), 447-451.

Learning points: RA in the ED; Multimodal Pain Management

12AP06-6

The wolf in sheep's clothing: a case report about unmasking atypical symptoms in a common complication

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Background: Obstetric patients have increased risk of PDHD due to their sex, young age and widespread use of neuroaxial blocks, even with fine-gauge spinal needles.¹ Although PDPH sometimes presents with atypical symptoms, other differential diagnoses should be considered, as they may reveal neurological emergencies

Case report: A 29-year-old woman at 40 weeks of gestation underwent an urgent c-section due non-reassuring fetal status, under spinal anesthesia, using a 25G Quincke needle, with Sufentanil, Bupivacaine and Morphine with no immediate complications. After thirty hours, the patient developed a sudden, severe holocranial headache (9/10), improved by orthostatism and worsened with head elevation, neck stiffness, nausea, vomiting and photophobia, with no neurological deficits or fever.

Given the diagnostic hypotheses of aneurysm rupture or sinus venous thrombosis, a non-contrast computed tomography scan was performed and was unremarkable. Conservative treatment with hydration and analgesics was started. The next day there was no relief of symptoms, so a sphenopalatine block was performed, with temporary improvement.

The headache recurred after 24 hours but it worsened with orthostatism, which pointed to PDPH. A magnetic resonance imaging revealed cerebrospinal fluid leakage at the L2-L3 level. Symptoms completely resolved after an epidural blood patch.

Discussion: We report a case of PDPH management, following c-section spinal anaesthesia with a 25G Quincke needle. The paradigm of our case is an atypical headache, which initially worsened in the supine position and was relieved by head elevation associated with meningeal signs. After a multidisciplinary approach, the final diagnosis of PDPH was reached. The present case rein-

forces that complications resulting from the neuraxial approach do not always present themselves in a typical manner, and that the approach must be multidisciplinary.

References:

1. Dinesh A, et al. A case of post dural puncture headache following labour epidural analgesia, managed by sphenopalatine ganglion block. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology.* 2022;11(12):3421

Learning points:

- 1. PDPH can occur after atraumatic spinal anaesthesia with a fine-gauge. needle, highlighting the need for vigilance and early recognition in obstetric patients.
- Although PDPH may present with atypical symptoms, other differential diagnoses must be considered, such as neurological emergencies.

12AP06-8

Ultrasound guided epidural blood patch in an obstetric patient with previously difficult neuraxial approach

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Background: Post-dural puncture headache (PDPH) is a complication of accidental puncture of the dura mater during epidural technique or intentional puncture during subarachnoid block. For PDPH refractory to conservative treatment, injecting autologous blood into the epidural space (epidural blood patch, EBP) is often effective!

Neuraxial ultrasound can aid EBP by allowing visualization of spinal anatomy and determining the epidural space depth, contributing to procedural success¹.

Case Report: We report a case of a 31-year-old obese woman, BMI of 31, who underwent ultrasound-guided EBP for persistent PDPH 4 days after elective caesarean section.

For elective caesarean delivery, four combined spinal-epidural attempts were unsuccessful, although no evidence of dural puncture was noted. The team opted to perform a spinal block using a 25G Quincke needle, reaching the L4-L5 intrathecal space at 11cm depth. The procedure was uneventful and both the patient and the newborn were asymptomatic on discharge (postoperative day 3)

On the fourth post-caesarean day, she developed PDPH unresponsive to conservative treatment. Neurological examination was normal and MRI was inconclusive, leading to a PDPH diagnosis with recommendation for an EBP. Lumbar ultrasound allowed identification of anatomical landmarks, including vertebral level, and located the epidural space at 10 cm depth, in accordance with MRI findings.

This space was identified by loss of resistance through a 12 cm Tuohy needle, and 15 mL of fresh autologous blood were injected. The procedure was uneventful. Eight hours later, the headache subsided, and the patient was able to stand and ambulate without neurological deficits or lumbar pain. After thorough explanation of warning symptoms, the patient was discharged home.

Discussion: This case highlights the value of ultrasound in neuraxial approaches, particularly in EBP after a previous difficult technique in obese patients.

Reference:

1. Uppal V, et al. Postdural puncture headache guidelines. *Reg Anesth Pain Med.* 2024:49:471–501.

Learning points: Ultrasound enhances vertebral structure identification and accurately estimates the depth of the epidural space, optimizing the efficacy and safety of neuraxial procedures.

This case highlights the role of neuraxial ultrasound in the anaesthesiologist's daily practice, revealing its potential impact on first attempt technique success rate, incidence of complications, patient satisfaction, and cost effectiveness.

12AP06-9

Postoperative dyspnea after arthroscopic rotator cuff repair: an unexpected complication of surgical irrigation

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Background: Among the known complications of brachial plexus block via the interscalene approach, including vascular puncture, Horner's syndrome, and total spinal anesthesia, pneumothorax and phrenic nerve paralysis are well-recognized causes of post-operative respiratory distress. However, when a patient develops respiratory difficulty, it is important to consider not only these factors but also complications associated with the surgical procedure itself. We report a case that highlights this issue.

Case report: A 68-year-old male, ASA-PS I, (height 170 cm, weight 59 kg), right-sided arthroscopic rotator cuff repair surgery. Prior to general anesthesia, an interscalene block was performed using ultrasound and nerve stimulation guidance without any complications. The surgery lasted 3 hours 24minutes, with minimal blood loss and a total of 58.8 L of irrigation fluid used. Following extubation in the operating room, the patient was alert with stable respiratory function. However, one hour postoperatively in the ward, he developed dyspnea. Chest X-ray revealed reduced transparency across the entire right pleural cavity, and chest CT demonstrated pleural effusion with bilateral subcutaneous tissue infiltration. As the patient's oxygen saturation remained at 99% with 2 L of supplemental oxygen, he was managed conservatively in the general ward. Clinical and radiological improvement was observed the following day, and the patient was discharged on the 8th postoperative day.

Discussion: Upon the patient's onset of dyspnea, initial differential diagnoses included phrenic nerve paralysis or pneumothorax secondary to the interscalene block. Imaging studies, however, revealed pleural effusion and soft tissue edema, likely resulting from surgical irrigation fluid accumulation. The postoperative complications appear to be associated with the prolonged surgical duration and the substantial volume of irrigation, which is consistent with findings reported in previous literature.

References:

Matsumoto Y, et al. Orthop Surg Traumatol. 2022;71(3):382-385.
 Abutalib RA, et al. Am J Case Rep. 2020;21:e926357.

Learning points: When a patient presents with postoperative dyspnea, it is crucial to consider not only anesthesia-related complications but also potential issues arising from the surgical procedure itself. Furthermore, comprehensive imaging studies are invaluable in establishing an accurate differential diagnosis.

12AP06-10

Analgesic efficacy of cervical retro-laminar block in patients undergoing posterior cervical spine surgery: a randomized controlled trial

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Background and Goal of Study: Posterior cervical spine surgery (PCSS) often requires extensive dissection of paravertebral muscles, and the surgical process also has certain damage to muscle attachment points, facet joint capsules, and other areas, which can cause significant pain in a short and a considerable time after surgery, seriously affecting the postoperative rehabilitation of patients.

This study explored the efficacy and safety of cervical retrolaminar block on postoperative pain after posterior cervical spine surgery.

Materials and Methods: 84 patients with the American Society of Anesthesiology functional status scores of I-III were included and assigned to two groups, and 60 patients were included in the final analysis. All included patients were randomly assigned to the CRL or LIA groups. Patients in the CRL group received cervical retrolaminar block 30 minutes before surgery, while patients in the LIA group received LIA before the wound was sutured.

The primary outcome was cumulative morphine consumption within the first 24 hours after surgery.

The secondary outcomes were postoperative pain scores on a Numeric Rating Scale (NRS), cumulative morphine consumption within the first 72 hours after surgery, intraoperative opioid consumption (sufentanil and remifentanil), and postoperative complications

Results and Discussion: Patients in the CRL group consumed significantly less morphine than the LIA group within the first 24 hours and the first 72 hours after surgery. The CRL group had significantly lower pain scores at rest in the PACU and 3, 6, 12, and 24 hours after surgery. The two groups did not differ significantly in the incidence of postoperative complications.

Conclusion(s): Cervical retro-laminar block postoperative could improve pain relief, and reduce opioid use in patients undergoing posterior cervical spine surgery.

12AP06-11

Sedation during surgical treatment of combat-related limb injury under regional anesthesia: patient preference and cortisol response

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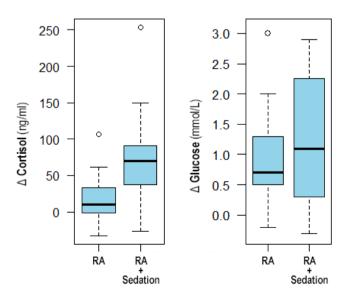
Background and Goal of Study: Wounded soldiers may refuse optional intravenous sedation due to previous negative experience or fear of adverse effects. Insufficient consciousness inhibition during stress-inducing medical procedures may negatively impact this patient population, delaying or limiting their physical and mental recovery.

This study aimed to determine whether initial patient preference is sufficient to predict unacceptable stress response to the intervention conducted under fully adequate regional anesthesia.

Parameter		Group R (n = 16)	Group RS (n = 16)	p-value	
	Before	97.5 ± 37.1 (74-127)	95.6 ± 47.2 (58-115)	0.897	
Cortisol (ng/mL)	After	115.9 ± 35.0 (87-136)	172.6 ± 79.4 (137-178)	0.002	
	Difference	77.0 ± 64.0 ((-1)-29)	18.41 ± 33.7 (40-90)	0.0006	
	Before	4.20 ± 0.85 (3.7-4.7)	4.44 ± 0.83 (3.9-5.0)	0.273	
Glucose (mmol/L)	After	5.13 ± 1.03 (4.5-5.5)	5.64 ± 0.97 (4.9-6.1)	0.117	
	Difference	0.93 ± 0.76 (0.5-1.3)	1.2 ± 1.13 (0.3-2.0)	0.705	

Table 1. Measured serum concentrations of cortisol and glucose and the difference between the measurements before and after the surgical procedure. Shapiro-Wilk test was used to establish normality, followed by Mann-Whitney U test due to predominantly non-parametric distribution.

Presented as mean ± standard deviation (25-75% interval).



Materials and Methods: Patients with blast and gunshot limb injuries that were scheduled for minor surgical interventions (secondary wound debridement, wound closure, VAC bandage placement or removal, removal of external fixation devices) that could be adequately anesthetized through up to two nerve blocks were consulted by an anesthesiologist on a day before the procedure.

Patient's preference on whether supplementary intravenous sedation should be conducted was used to distribute him into regional only (R) or regional plus sedation (RS) group. Blood samples were obtained before and after the procedure.

Results and Discussion: Out of the 52 initially included patients, 32 met the final criteria, 12 were excluded due to unplanned use of opioids.

Conclusions: When choosing anesthetic approach for minor surgical procedures during treatment of combat injuries of the limbs. patient preference appears to be unreliable as a sole measure for the need for sedation to minimize cortisol stress response when adequate analgesia is provided via regional methods. No significant difference in serum glucose concentration changes was observed.

Acknowledgements: This study is a part of a research program funded by the Ministry of Health of Ukraine.

12AP06-12

Maxillary and mandibular nerve block: Two-in-one – A cadaveric study with preliminary results

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Background and Goal of Study: The volume of local anaesthetic injected into the pterygopalatine fossa for maxillary nerve block is controversial. The typical volume of the pterygopalatine fossa in adults has been reported as close as 1mL in dry skulls. However, 2-5 ml are clinically injected. After filling the pterygopalatine fossa during maxillary nerve block, where the remaining local anaesthesia diffuses has not been formally investigated.

The objective of this study was to identify the degree of local anaesthesia disseminated to the nerve branches of the mandibular nerve when performing the maxillary nerve block.

Materials and Methods: Maxillary nerve dye injection and dissection were performed bilaterally in the pterygopalatine fossa of four lightly embalmed cadaveric specimens (4 specimens, 8 injections). Infiltration of 2ml or 5ml of contrast into the pterygopalatine fossa was performed using a suprazygomatic approach and ultrasound-guidance through an infrazygomatic window.

Results and Discussion: The pterygopalatine fossa, pterygopalatine ganglion, infraorbital nerve, palatine nerves, and mandibular nerve branches (auriculotemporal nerve, inferior alveolar nerve, lingual nerve) were dyed consistently in both groups.

Images:





Conclusion(s): This cadaveric study shows that a single block applying 2 or 5mL of local anaesthetic in the pterygopalatine fossa can spread to the second and third branches of the trigeminal nerve, and could provide anaesthesia/analgesia for surgeries involving the lower two thirds of the face.

References:

- 1. Anugerah A, et al. Reg Anesth Pain Med 2020;45(4):301-5.
- 2. Molins G, Valls-Ontañón A et al. Journal of Oral and Maxilofacial Surgery 2024:82(4):412-21.
- 3. Kumita S, et al. J Anesth 2022;36:46-51.

12AP07-1

Postoperative analgesic effectiveness of PENG block and lumbar erector spinae plane block in total hip arthroplasty: A prospective randomized study

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Background and Goal of Study: Total hip arthroplasty is one of the orthopedic surgeries with moderate to severe postoperative pain. While choosing peripheral nerve block in multimodal analgesia, targeting only sensory block contributes to reduced postoperative opioid consumption, early mobilization and shortens the length of hospital stay. We hypothesized that combined application of Pericapsular Nerve Group (PENG) block and Lumbar Erector Spinae Plane Block (L-ESPB) changes postoperative opioid consumption compared to their application alone.

Materials and Methods: In this single-center study conducted from January 2023 to July 2024, 66 patients with ASA I-III undergoing total hip arthroplasty surgery were randomized into three groups: L-ESPB, PENG, or L-ESPB and PENG combined. After spinal anesthesia, 20 ml of 0.25% bupivacaine was applied to the operated side in the PENG group, 40 ml of 0.25% bupivacaine was applied in the L-ESPB group and in the PENG+L-ESPB group, local anesthetic was applied in the same volume, but not exceeding a maximum of 2,5 mg/kg.

Postoperative analgesia was provided with patient-controlled intravenous morphine, and tramadol as rescue analgesia for NRS pain scores above 4. The primary outcome was 24-hour total opioid consumption, with secondary outcomes including opioid consumption at 6 and 48 hours, pain scores, rescue analgesia requirements, and time to discharge from hospital.

Results and Discussion: NRS scores were similar between the groups and NRS <4 was recorded at all measurement times (p>0.05). Total 24-hour morphine consumption (mg) was 17.32±12.99 in the L-ESPB group, 14.32±9.66 in the PENG group, and 13.77±8.61 in the L-ESPB+PENG group and was comparable among the groups (p=0.8). Morphine consumption was similar between the groups at all time intervals (p>0.05). Morphine consumption at 24-36 hours was significantly higher in the L-ESPB group than at 0-2 hours (p=0.005, Bonferroni corrected) and 6-12 hours (p=0.007, Bonferroni corrected) Rescue analgesic requirement was similar between the groups at all time intervals.

Conclusion(s): PENG and L-ESPB blocks provided effective postoperative analgesia in patients undergoing hip surgery. The combination of PENG and L-ESBP blocks was not superior to the application of either block individually.

12AP07-2

The single-injection femoral triangle block (FTB) for total knee arthroplasty (TKA) towards safety and better postoperative functionality

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Background and Goal of Study: The femoral triangle block (FTB) is an important technique in regional anaesthesia, mainly utilised to manage postoperative pain for patients undergoing total knee arthroplasty (TKA). This report outlines the significance, methodology, comparisons, and outcomes associated with the FTB in the context of knee prosthesis surgery.

The study aims to compare the effectiveness of spinal anaesthesia alone versus spinal anaesthesia enhanced with ultrasoundguided FTB in improving perioperative pain relief and functional recovery in patients undergoing TKA.

Materials and Methods: We conducted a prospective observational study in which patients were randomised based on informed consent to receive a regional anaesthesia block after spinal anaesthesia for TKA. 117 patients scheduled for TKA were divided into two groups: one group received spinal anaesthesia alone (SA group; n=41), and the other group received spinal anaesthesia in conjunction with an FTB (SARB group; n=76).

In the SARB group, the femoral nerve block was administered postoperatively under ultrasound guidance with 15 millilitres of 0.25% bupivacaine. The spinal anaesthesia was ordinated with 2,8 millilitres of 5% levobupivacaine.

We included patients with ASA I-III but excluded those with opioid addiction, rheumatoid arthritis, and allergies to local anaesthetic

Results and Discussion: The two groups showed a significant correlation regarding the onset of pain postoperatively, VAS 5 or more (p = 0.03), and the total amount of analgesics required in the first 36 postoperative hours (p = 0.05). PONV, intraoperative and postoperative hemodynamic stability did not exhibit significant differences between the groups.

However, postoperative hypotension was linked to reduced functional recovery, as evidenced by physical treatment on the day of surgery (p < 0.01) and functional mobility test level (p = 0.02). Additionally, the time to the onset of pain, measured on the VAS scale (rating of 5 or higher), was associated with the functional mobility test (p = 0.02) and the length of hospitalisation (p = 0.05).

Conclusion(s): The administration of a single-injection femoral triangle block (FTB) after spinal anaesthesia for total knee arthroplasty (TKA) is a crucial intervention that prioritises patient safety and significantly boosts postoperative functionality. It facilitates a smoother recovery process and improved mobility for patients.

12AP07-3

Successful low-dose continuous spinal anesthesia for retrograde intrarenal surgery in a patient with hereditary muscular dystrophy: A case report

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Background: Endoscopic procedures for renal stones are increasingly popular due to their minimally invasive nature. Spinal anesthesia (SA) offers comparable outcomes to general anesthesia (GA), with added benefits for patients with significant comorbidities.1,2

We present a case of a woman with severe respiratory impairment successfully undergoing RIRS with low-dose continuous spinal anaesthesia (CSA), achieving excellent tolerance and no complications.

Case report: A 66-yr-old woman, ASA 4, with hereditary muscular dystrophy (heterozygous TTN gene mutation), causing severe restrictive respiratory syndrome requiring 24-hour/day non-invasive ventilation, daily cough-assist, and moderate dysphagia.

Comorbidities includes hypertension, dyslipidemia and renal lithiasis, and she was scheduled for RIRS. CSA was proposed after discussing risks and benefits, and informed consent was obtained. In the operating room, standard ASA monitoring was established, and 1mg of intravenous (IV) midazolam and 50mcg of IV fentanyl were administered.

A subarachnoid catheter was placed via a paramedian approach, delivering 2mg of 0.5% isobaric bupivacaine and 2mcg of sufentanyl, with an additional 1mg of bupivacaine given at surgery onset. Paracetamol and dexamethasone were also administered. The 93-minute procedure in lithotomy position was completed with adequate intraoperative conditions. The patient had an uneventful recovery, being discharged after 2 days.

Discussion: This case highlights the successful use of CSA in a high-risk patient undergoing RIRS. CSA avoided the risks of GA, such as respiratory decompensation and hemodynamic instability, as mentioned in other published case reports.1,2

The approach ensured effective surgical conditions, excellent postoperative tolerance, and a smooth recovery.

References:

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Learning points: Low-dose CSA enables precise anesthetic titration, ensuring optimal surgical conditions while effectively minimizing the risk of hemodynamic instability and respiratory compromise, particularly in high-risk patients.

12AP07-4 Halloween costume: The ASA I patient in disguise

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Hemophilia A is a rare, X-linked disorder characterized by a deficiency in coagulation factor VIII. Diagnosis often hinges on a thorough personal or family history of bleeding, as clinical suspicion typically precedes laboratory findings, making a detailed history the first line of diagnostic investigation.

Standard tests, including prothrombin time (PT) and activated partial thromboplastin time (aPTT), frequently remain within normal limits; in fact, aPTT abnormalities may only emerge when factor VIII activity drops below 15%. In those cases neuraxial anesthesia is contraindicated due to a hematoma risk of approximately 1 in 315, while peripheral nerve blocks may be cautiously considered, contingent on ultrasound guidance and appropriate factor VIII supplementation.

Here, we present a case that challenges conventional preoperative assumptions. A 16-year-old ASA I patient, evaluated for elective knee surgery to excise an osteoarticular cyst, displayed entirely normal laboratory results during the anesthesiology consultation.

Combined anesthesia (general anesthesia with epidural block) was administered without intraoperative incidentes. The epidural catheter was removed after 48 hours due to urinary retention and patient discomfort.

Unexpectedly, the postoperative course was complicated by escalating hemorrhage in the operated limb, prompting a focused anamnesis, which uncovered a previously unreported family history of hemophilia only 72 hours after the initial procedure.

Further assessment, including lumbosacral imaging, excluded any epidural technique complications, while laboratory testing subsequently revealed a factor VIII activity level of 28%, with aPTT still within normal range.

This case emphasizes the limitations of standard preoperative screenings in determining the appropriateness of regional anesthesia techniques, even in patients without known comorbidities. Although the anesthetic management yielded a favorable outcome, this case underlines the need for a potentially more rigorous preoperative assessment for latent bleeding disorders, especially when postoperative complications arise that initially appear isolated to the surgical field.

Such findings may prompt a re-evaluation of preoperative protocols to enhance patient safety.

12AP07-5

The effect of Body Mass Index on postoperative acute pain in lumbar disc herniation surgery

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Background and Goal of Study: Obesity has become a global public health issue. Elevated BMI complicates the application of nerve blocks and adversely affects postoperative pain levels.

This study aimed to investigate the relationship between body mass index (BMI) and postoperative pain levels in patients undergoing lumbar disc herniation (LDH) surgery, anesthesia, and analgesia.

Materials and Methods: Our study was conducted prospectively and observationally on patients in ASA I-II-III risk groups who underwent LDH surgery in the neurosurgery clinic of our hospital (https://clinicaltrials.gov/NCT06257953). Patients were classified into three groups based on their BMI levels: Group 1 (BMI: 18-24.9 kg/m²), Group 2 (BMI: 25-29.9 kg/m²), and Group 3 (BMI: 30-40 kg/m²). Erector spinae plane (ESP) block was performed under ultrasound guidance at the lumbar transverse process level, with 15 mL of 0.25% bupivacaine administered bilaterally.

Between the three groups, the following parameters were compared: patient age, BMI, gender, any complications observed during the procedure or postoperative follow-up, duration of anesthesia, duration of surgery, postoperative pain scores (Visual Analog Scale, VAS), and postoperative additional analgesic consumption. Results and Discussion: A total of 75 patients were included in our study between January 14, 2024, and April 19, 2024. In Group 3, remifentanil consumption, block application duration, the number of failed attempts, and additional analgesia requirements were significantly higher compared to Group 1.

Patients in Group 3 had significantly higher VAS-rest and VAScough scores at 1, 2, 6, 12, and 24 hours compared to those in Group 1. Similarly, VAS-rest and VAS-cough scores at 1, 6, 12, and 24 hours were significantly higher in Group 3 than in Group 2. Additionally, patients in Group 2 exhibited significantly higher VAS-rest and VAS-cough scores at 1, 2, 6, and 12 hours compared to Group 1. Additional analgesia was required in 35 patients (36.7%), and this need was significantly higher in obese patients (72%).

Conclusion(s): In patients undergoing LDH surgery, an increase in BMI was associated with higher pain scores, greater additional analgesic requirements, increased remifentanil consumption, a higher number of failed attempts, and prolonged block application times. Consequently, obese patients should be evaluated more carefully for postoperative pain management.

12AP07-6

Long term popliteal sciatic nerve block catheter for combat trauma management: a case report

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Background: Combat lower limb injuries cause severe pain from fractures and tissue damage and require multiple surgical debridements. Popliteal sciatic nerve catheter can be used for intraoperative and postoperative pain relief.

We present a case where such a catheter was maintained for 57 days without complications, which is much longer than described in literature.

Case Report: A physically healthy 28-year-old with severe nociceptive pain (numerical pain score of 8) due to externally fixated tibial fracture and infected fasciotomy wounds after a recent blast injury. The pain was not responsive to NSAID's.

After obtaining the patient's consent, a 20G perineural catheter was placed inside the sciatic nerve paraneurium under ultrasound guidance via the popliteal approach.

The catheter was threaded 14 cm to the skin level, tunneled intradermally and fixed with a sticker. After a trial bolus of 20 ml of 1% lidocaine, effective analgesia was obtained, with numerical pain score reduced to 0.

Subsequently, an elastomeric pump with 0.25% bupivacaine was attached to the catheter at a rate of 10 ml/h. Over the next 45 days, the patient underwent 9 surgical procedures using combined inhalational non-opioid anesthesia with a LMA and perineural anesthesia with 20 ml of 0.5% bupivacaine.

Also, 20 ml of 0.25% bupivacaine was administered before each dressing change, which provided sufficient analgesia. A month later, due to a slight increase in pain, the patient received additional 10 ml of 0.25% bupivacaine every morning using patientcontrolled analgesia.

During the entire time the catheter was in place, the pump was replaced five times, the patch was replaced twice and the maximum pain on the numerical pain scale was 4 points.

Two weeks after wound closure, on the 57th day of catheter in place, the patient was pain-free, and the catheter was removed. There were no signs of inflammation at the puncture site.

Discussion: Our case demonstrates that long-term placement of continuous popliteal nerve block catheter provides sufficient pain relief for the entire cycle of combat wound healing and minimizes the use of opioids during anesthesia.

Learning points: Perineural sciatic catheter can function successfully for 57 days without complications.

12AP07-7

Use of saphenous block and sciatic block in guillotine amputation of the lower limb

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Background: Peripheral nerve blocks (PNBs) are a widely accessible anesthetic technique used in various surgeries. This case report presents the use of sciatic-popliteal and saphenous blocks in a vascular surgery.

Case Report: A 65-year-old woman with Type 2 Diabetes, Hypertension, bronchial asthma, and corticosteroid-dependent bronchiectasis (which caused baseline dyspnea with minimal exertion and poor tolerance to lying down) presented with right lower limb pain and wet gangrene, requiring urgent guillotine amputation. She had a history of femoropopliteal bypass.

Her baseline oxygen saturation was 88%, and lab results showed elevated inflammatory markers (C-reactive protein 253 mg/dL, procalcitonin 5.1 mg/dL), worsening renal function (creatinine 1.5 mg/dL, GFR 59 ml/min), and coagulopathy (INR 1.8).

Given her clinical condition, general or neuroaxial anesthesia were not suitable. Therefore, a sciatic-popliteal block and saphenous block were performed under ultrasound guidance. The blocks were successful, with proper anesthetic distribution and no complications.

The patient reported no pain (VAS 0/10) in the intraoperative period as well as in Post-Anesthesia Care Unit (PACU) and was discharged to the ward four hours later.



Discussion: Coagulopathy prevented neuroaxial anesthesia, and the patient's respiratory issues made general anesthesia challenging.

The peripheral nerve blocks allowed safe completion of the procedure. Ultrasound guidance was essential in ensuring proper block placement and avoiding complications like vascular puncture.

References:

- 1. Krombach, Jens, and Andrew T. Gray. "Sonography for saphenous nerve block near the adductor canal." Regional Anesthesia and Pain Medicine, 32(4) (2007): 369-70. https:// doi:10.1016/j.rapm.2007.04.006.
- 2. Lin, Roy, et al. "Effects of anesthesia versus regional nerve block on major leg amputation mortality rate." Vascular, 21(2) (2013): 83-6. https://doi:10.1177/1708538113478718.

Learning Points: Peripheral nerve blocks offer an alternative to general or neuroaxial anesthesia in high-risk patients. However, they are operator-dependent, so a backup anesthetic plan should always be prepared.

12AP07-8 Continuous ESP block for Kommerell diverticulum resection: a case report

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Background: Kommerell diverticulum (KD) is a developmental anomaly of the aortic arch characterized by a diverticulum at the proximal descending aorta. While usually asymptomatic, it can be associated with tracheoesophageal compression. Given the worldwide implementation of ERAS pathways and the recognition of regional techniques as part of multimodal analgesic strategies. we report a case of KD resection performed under combined general anesthesia with a continuous Erector Spinae Plane block (ESPB).

Case Report: A 63 year old woman, ASA II, diagnosed with KD following complaints of dysphagia and persistent cough, was scheduled for surgical removal via left thoracotomy. Following induction of general anesthesia and vascular catheterization, an ESPB was performed at T5 level with 20mL of Ropivacaine 0.375%, followed by ultrasound-guided perineural catheter placement. Additional intraoperative analgesia was obtained with fentanyl boluses (total of 400mcg over 4h). The procedure was uneventful and the patient was transferred to the ICU under mechanical ventilation and IV sedation. In addition to conventional post-operative analgesia, a 48h perineural infusion of 0.2% ropivacaine at 7mL/h was initiated at the end of the procedure. The patient was extubated within the first 4 hours following surgery with adequate pain control, and discharged from ICU after 48h.

Discussion: Multimodal opioid-sparing analgesic strategies are an essential component of ERAS pathways, allowing a safe and early extubation, less postoperative pulmonary complications and better clinical outcomes. Despite its established role in thoracic surgery, regional techniques such as thoracic epidural or paravertebral blocks have a limited use in cardiac surgery, given the systemic heparinization associated with these procedures (1). In this setting, ESPB has emerged as a safe and effective alternative. This case reports the successful use of continuous ESPB for postoperative pain management, enabling an early extubation and rapid recovery following KD resection.

Reference:

1. Nair, A., et al. (2023). Erector spinae plane block for postoperative analgesia in cardiac surgeries- A systematic review and meta-analysis. Annals of cardiac anaesthesia, 26(3), 247-259.

Learning points: Continuous ESPB should be considered as an effective alternative to neuraxial techniques for cardiac surgery, as part of a multimodal opioid-sparing analgesic strategy.

12AP07-9

Awake breast surgery: a regional strategy for a patient with pulmonary hypertension

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Background: Most women diagnosed with breast cancer will undergo surgery as part of their treatment. When advanced and severe cardiorespiratory pathology is present, rendering them unsuitable for general anesthesia (GA), an alternative approach involving a combination of regional techniques becomes imperative, particularly in time-sensitive breast and axillary surgeries.

Case Report: We report the case of a 69-year-old woman, ASA IV, with severe untreated pulmonary hypertension (PSAP 81 mmHg) and compromised functional capacity (2 MET), diagnosed with invasive breast cancer and scheduled for mastectomy with sentinel lymph node biopsy. Physical examination additionally revealed multiple difficult airway predictors and basal SpO2 88%.

The patient was deemed unfit for GA and the procedure was performed under regional anesthesia and moderate sedation. Thoracic paravertebral blocks (TPVB) were performed at T3 and T5 levels, with 15+13 mL of Levobupivacaíne 0.4% with adrenaline, followed by catheter placement at T5 level; additionally, Interpectoral Plane (IPPB) and Pectoserratus plane blocks (PSPB) were performed, with 20+10 mL of Levobupivacaíne 0.25%.

The patient was sedated with continuous dexmedetomidine and bolus ketamine without complications. Paracetamol 1000 mg, ketorolac 30 mg, and dexamethasone 8 mg were given as multimodal analgesia. The postoperative period was uneventful and for postoperative analgesia, intermittent perineural boluses with 10 mL of ropivacaine 0.2% were prescribed.

Discussion: TPVB is a well-established option for adequate surgical anesthesia for breast surgery. Given the complex innervation of the breast and axillary region, an association of multiple techniques is required, and the optimal combination is still up for debate.

This case reports the successful use of TPVB with PSPB and IPPB for anesthesia and pain management for mastectomy with sentinel lymph node biopsy.

References:

1. Schnabel, A., et al. (2010). Efficacy and safety of paravertebral blocks in breast surgery: a meta-analysis of randomized controlled trials. British Journal of Anaesthesia, 105(6), 842-852. 2. Hamilton, D. L., & Pawa, A. (2022). Anaesthesia for awake breast surgery. BJA education, 22(12), 452-455.

Learning Points: Two-level TPVB in association with PSPB and IPPB provides adequate surgical anesthesia for breast and axillary surgery and should be considered as an alternative to GA in selected cases.

12AP07-10

Brugada syndrome: epidural analgesia with ropivacaine as a safe option

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Background: Brugada syndrome is an autosomal dominant disorder characterized by abnormal myocardial transmembrane sodium conduction, which predisposes to ventricular tachyarrhythmias and sudden cardiac death in the absence of structural heart disease. Many factors during anesthetic management could precipitate malignant dysrhythmia.

We present a case of epidural management with ropivacaine of a Brugada Syndrome patient.

Case Report: We present the case of a 63-year-old male with an ASA II physical status and a past medical history of Brugada Syndrome diagnosed through routine ECG and genetic analysis. He was diagnosed with a splenic flexure tumor and a right inguinal hernia, for which laparoscopic extended right hemicolectomy and Lichtenstein hernioplasty were proposed.

First, defibrillator pads were placed and isoprenaline infusion was prepared. A 5-lead ECG, invasive blood pressure, capnography, pulse oximetry, and bispectral index (BIS) were used for monitoring. We administered 200 µg of intrathecal morphine and induced balanced general anesthesia with propofol, maintained with sevo-

Due to surgical difficulties, the procedure was converted to an open surgery, and at the end, a thoracic epidural catheter was inserted at the T9-T10 level for postoperative analgesia.

During the 72-hour postoperative period, PIEB with 0.1% ropivacaine (6 mL/h, PCA 4 mL, lockout interval 30 minutes) were administered under continuous ECG monitoring in an intermediate care unit. Hemodynamic stability and pain control were maintained, and no rhythm alterations were observed.

Discussion: During anesthesia, several drugs can interact with cardiac ion channels, potentially triggering malignant arrhythmias and, therefore, should be avoided in patients with Brugada Syn-

Of particular concern is the administration of local anesthetics due to their sodium channel-blocking properties, with adverse effects related to the plasma concentration achieved due to systemic absorption. To date, there is limited evidence regarding the safety of using epidural ropivacaine in these patients.

Our case report highlights the successful use of epidural ropivacaine 0.1% for postoperative analgesia. We emphasize the importance of monitoring these patients closely during the anesthetic procedure.

Learning points:

Epidural analgesia with ropivacaine is a suitable option for these

Antiarrhythmic drugs and a defibrillator must be ready to use.

12AP07-11

Two days with single shot block? It's possible

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Background: Peripheral nerve blocks (PNB) are common in anaesthesia, with a low incidence of nerve injury.1 In cases of prolonged sensory and motor block, a multidisciplinary approach is essential

Case Report: A 35-year-old male with obesity and hypertension underwent outpatient arthroscopic meniscectomy. Neurological exam was normal. With ASA monitoring, 1 mg midazolam and 50 μg fentanyl were given IV. Ultrasound-guided PNB of the saphenous nerve in the adductor canal and popliteal sciatic nerve (10 + 15 mL of 0.375% ropivacaine) were performed, with no blood aspiration, increased pressure or reported symptoms.

There were no complications, except for technical difficulties due to low image quality. General anaesthesia followed, and 4 mg dexamethasone administered IV. A tourniquet was applied at 280 mmHg (systolic blood pressure of 132 mmHg) on the right thigh for 23 minutes, with surgery lasting 33 minutes.

He was monitored in recovery and discharged 6 hours later, with expected motor and sensory block in the right leg. At 24-hour follow-up, he reported persistent motor block of the right lower limb, moving only his toes, with sensory block and paresthesia in L4 and L5 dermatomes. Deficits were confirmed in the emergency department. Orthopedic evaluation ruled out nerve compression, and ultrasound excluded deep vein thrombosis. It was assumed that the deficits were related to the PNB, after assessment by the acute pain unit.

At 40 hours post-surgery, he had 3/5 strength in the quadriceps and mild sensory reduction in L4-L5 dermatomes below the knee. By 52 hours, all deficits had resolved, and he was discharged.

Discussion: In cases of prolonged nerve block, ruling out other causes of deficits is crucial. Literature shows that 0.5% ropivacaine for sciatic nerve blocks yields sensory block lasting up to 11.2 hours and motor block up to 9.3 hours.2

With 0.375% ropivacaine a shorter duration was expected.

The longer effect may have resulted from low image quality affecting adequate anesthetic deposition, with possible subepineural administration.3

References:

- 1. BJA Education. Volume 18, Issue 12, 384-390.
- 2. Turk J Anaesth Reani. 2018;46(1):15-20.
- 3. Korean J Pain. 2021;34(1):132-136.

Learning points: Optimal conditions are essential for PNB safety. Even with relatively low concentration ropivacaine, prolonged blocks may occur, requiring a multidisciplinary approach and close monitoring. Subepineural administration may explain extended block duration.

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12AP07-12

High-transhumeral amputation under regional anesthesia in a fragile patient: a case report

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Background: Peripheral nerve blocks (PNB) have advantages over general anesthesia, including preventing respiratory complications in the risky patient group, accelerating mobilization, shortening the hospital stay, and reducing postoperative opioid use. In this report, we presented our fragile patient who underwent high-transhumeral amputation surgery under regional anesthesia.

Case Report: A 85-year-old female patient who has a history of coronary and peripheral artery disease, asthma, and hypertension was evaluated in the ASA-4 risk group. Transhumeral amputation was planned for the patient with necrosis spreading from the distal part of the right hand to the right arm.

The patient was planned to undergo PNB to avoid respiratory and hemodynamic complications, provide effective postoperative analgesia, and shorten the duration of postoperative intensive care

The patient, for whom consent was obtained from herself and her relatives for the procedure, was monitored. A 30 ml solution consisting of 15 ml of 0.5% Bupivacaine, 7.5 ml of 2% Lidocaine, and 7.5 ml of physiological serum was prepared. After sterilization, a 50 mm PNB needle was advanced into the interscalene space using the in-plane technique under ultrasound guidance. 15 ml of local anesthetic (LA) solution was applied to the brachial plexus in the interscalene space.

Then, the brachial plexus trunks were visualized around the subclavian artery for a supraclavicular block. 15 mL of LA solution was administered using a similar technique. After 30 minutes, the operation began after a pinprick test.

The patient underwent a high-transhumoral amputation without any problems. The patient was transferred to the surgical intensive care unit for close follow-up in the postoperative period, with her general condition and hemodynamic parameters being compatible with those before the operation.

After 24 hours of CYB hospitalization and 2 days of ward followup, the patient was discharged with recovery.

Discussion: Complications that may occur due to general anesthesia can be prevented with awake surgery, especially in risky patients.

In addition, anesthesia and surgery times may be shorter, and the discharge time may be faster. In high-risk and geriatric patients, peripheral nerve blockade may be preferred to general anesthesia unless there is an absolute contraindication.

12AP08-2 PECS blocks that reached brachial plexus: is it possible?

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Background: Regional anaesthetic techniques, usually combined with general anaesthesia, have become common in perioperative management of the patient for breast cancer surgery. The use of pectoral nerve blocks (PECS) I and II, provide an excellent postoperative analgesia, an opioid sparing, and reduction in postoperative nausea and vomiting.1

Case Report: We present a case of a female patient, 58 yearsold, ASA II. Proposed for surgery to remove breast expanders with placement of implants. With a personal history of breast cancer. A combined anesthetic technique was performed, total intravenous anesthesia with PECS I and II block, ultrasound-guided, bilateral, with ropivacaine 3 mg/mL, 150 mg (50 ml) in total, uneventful.

The surgery was uneventful, extubated without complications, paracetamol and ketorolac were administered for postoperative analgesia, sparing opioids use, and transferred to the Post-Anesthetic Care Unit (PACU). In PACU, the patient denied any pain but complained of lack of strength in her left upper limb. Upon evaluation, she presented complete motor and sensory blockade in the territory of the median and musculocutaneous nerve, unable to elevate the left upper limb against gravity.

After a complete neurological examination with no other changes, it was explained to the patient that it was a rare complication of local anesthetic migration and that she would be kept under observation until complete resolution.

This distribution of the local anesthetic, from the plane of the pectoral nerve and serrated to the plane of the brachial plexus, may have occurred due to the alteration of normal anatomy due to the dissection of tissues and muscles in the previous surgery.

She was discharged to the infirmary, with continuous monitoring, having complete resolution of the blockade after 10pm, without any residual deficit.

Discussion: This case highlights the importance of knowing this type of complications that although rare, may become more common with the increase in regional anesthesia techniques in postmastectomy or lumpectomy breast reconstructive surgery.

Reference:

A. Sherwin, D.J. Buggy, Anaesthesia for breast surgery, BJA Education, 18(11): 342e348 (2018)

Learning points: A high degree of clinical suspicion is necessary, exclusion of other differential diagnoses such as stroke or nerve injury due to perioperative compression and poor positioning, close surveillance in the postoperative period and reassurance of the patient are essential.

12AP08-3

Comparison between Supra-inguinal Fascia Iliaca Block, intrathecal morphine and their combination in postoperative pain trajectory after total hip arthroplasty: preliminary results of a double-blind randomized clinical trial

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Background and Goal of Study: Posterolateral-approached total hip arthroplasty (PLTHA) can be characterized by moderate to severe early postoperative pain with potential impairment of functional recovery. Low-dose intrathecal morphine (ITM) or suprainguinal fascia iliaca (SFIB) blocks have been recommended to provide adequate analgesia.¹

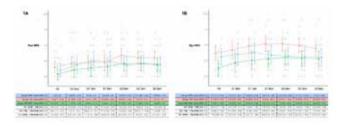
Our aim was to compare these techniques and their association regarding pain trajectory during the first 48 hours following PL-THA.

Materials and Methods: Thirty-eight consenting patients scheduled for PLTHA with spinal anesthesia were prospectively and randomly allocated into three groups. Patients received either SFIB [40mL ropivacaine 0.375% (SFIB and ITM-SFIB groups) or saline (ITM group)], and 1 mL of intrathecal morphine 0.01% (ITM and ITM-SFIB groups) or saline (SFIB group).

A blinded observer noted the evolution of rest and dynamic pain on 11-points numeric rating scale (Rest NRS and Dyn NRS) 8 hours after surgery (H8) and at 8am, 1pm and 6pm at postoperative day-1 (D1) and day-2 (D2). Differences between groups and time-groups interactions were analyzed using generalized linear mixed model tests.

Results and Discussion: No significant effect of group (P=0.31) nor time-group interaction (P=0.65) was observed for rest NRS. A significant effect of group was observed for dynamic pain (P=0.02), without group-time interaction (P=0.55).

Post hoc comparisons revealed that the ITM-SFIB group had better pain trajectory than the ITM group, over all observed time-points (Figure).



Conclusion(s): In PLTHA, no difference was observed between the SFIB and the ITM regarding postoperative pain trajectory at rest and movement during the first 48 hours. The association of SFIB with ITM is superior to ITM alone, but not to SFIB alone, regarding dynamic pain during the first 2 days. These results need to be confirmed once the planned sample size (114) will have been recruited.

Reference:

Anger M et al., Anaesthesia. 2021 Aug;76(8):1082-1097. doi: 10.1111/anae.15498.

12AP08-4

Comparison of the analgesic efficacy of Erector Spinae Plane Block and superficial parasternal block in open cardiac surgery: a pilot study

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Background and Goal of Study: Postoperative pain management is crucial for recovery. While regional analgesia methods are effective, direct comparisons between techniques are limited. This study evaluates the efficacy of erector spinae plane (ESP) and superficial parasternal blocks in postoperative opioid consumption and dynamic pain control.

Materials and Methods: This pilot study, part of a randomized controlled trial (NCT06322810) at Taichung Veterans General Hospital, included 36 patients undergoing first-time open-heart surgery via sternotomy. Patients were randomly assigned to receive either an ESP or a superficial parasternal block. Both blocks involved the administration of 20 mL of 0.5% Ropivacaine bilaterally preoperatively and 0.16% Ropivacaine boluses every 4 hours postoperatively. All patients received IV acetaminophen 1 g every 6 hours, with IV tramadol as rescue analgesia. The primary outcome was 48-hour oral morphine equivalent (OME), and secondary outcomes included static and dynamic pain scores measured using the Numeric Rating Scale (NRS, 0–10) at 12, 24, 36, and 48 hours.

Results: The median age of patients was 59 years, with a median EuroSCORE of 2.52. Of the 36 patients analyzed (18 ESP, 18 parasternal), demographic characteristics were comparable between groups. There were no significant differences in post-operative ventilator-dependent duration or length of hospital stay. Postoperative 48-hour OME was also similar (ESP: 17.5 mg [9–30] vs. Parasternal: 25 mg [15–41], p = 0.125). Resting pain scores showed no significant differences.

However, dynamic pain scores were significantly lower in the ESP group at all time points:

- 12 hours: ESP 0 (0-3) vs. Parasternal 3 (2-5), p = 0.035
- 24 hours: ESP 0 (0-3) vs. Parasternal 5 (2-5), p = 0.004
- 36 hours: ESP 2 (0-4) vs. Parasternal 4 (2-6), p = 0.010
- 48 hours: ESP 2 (0–3) vs. Parasternal 3 (2–5), p = 0.035 (Fig. 1).

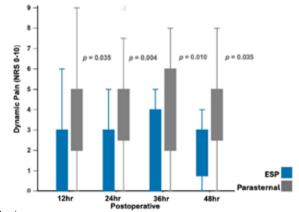


Fig. 1.

Conclusion: Both blocks provided similar resting pain control, opioid-sparing effects, ventilator duration, and hospital stay, but the ESP Block demonstrated superior dynamic pain control post-operatively.

12AP08-5

Ultrassound-guided Infrazygomatic Pterigopalatine Fossa Block (IZPFB) for tonsillectomy surgery in adults

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Background: Tonsillectomy is a very common surgical procedure, but frequently associated with moderate to severe postoperative pain.

An optimal analgesia promotes comfort, reduces anxiety and allows an early oral intake and hydration¹.

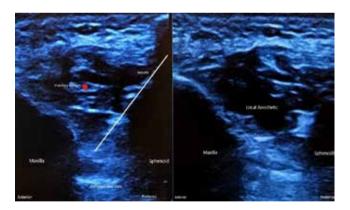
With a median recovery time of 10 days, the first 3-5 days after surgery are the most painful. A multimodal analgesia should be performed, avoiding adverse effects, particularly those related to opioids.²

Regional analgesia techniques, like infrazygomatic pterygopalatine fossa block (IZPFB) are great alternatives and should be included as part of multimodal analgesia.

Case Report: A 26 and 41 year-old women, ASA I and II, respectively; and a 45 year-old man, ASA II, were admitted for tonsillectomy due to recurrent tonsillitis.

For all patients, general anesthesia was performed followed by bilateral ultrasound-guided IZPFB with Ropivacaine0.2% 20mg and dexamethasone 8mg. Paracetamol and ketorolac were also administered.

In the Post Anesthetic Care Unit (PACU), only one of the patients mentioned little discomfort, mostly associated to swallow movement. Patients reported little to zero pain during hospital stay with paracetamol and ketorolac.



Discussion: Ropivacaine and dexamethasone injected in the pterygopalatine fossa bathes the maxillary nerve promoting a long lasting analgesic effect.

The infrazygomatic approach using landmarks present some risks like puncture of the maxillary artery, submucosal abcess or intraorbital injection.

An ultrasoung guided technique allows identification of the internal maxillary artery, needle tip and spread of local anesthetic.

Reference:

1. Qian, L., Li, X., Chen, H. & Chi, X. (2020). Recent advances in post-tonsillectomy analgesia. Digestive Medicine Research; Vol 3 (September 2020): Digestive Medicine Research; Opioidfree anesthesia. Beloeil H. Best Pract Res Clin Anaesthesiol. 2019;33:353–360. doi: 10.1016/j.bpa.2019.09.002. [DOI] [PubMed] [Google Scholar]

Learning points: Regional analgesic techniques, whenever possible, should be applied in order to promote better comfort, as well as avoid possible adverse effects related to opioids.

12AP08-6

Effectiveness of Combined Serratus Anterior Plane Block in managing acute pain after breast-conserving surgery: a case series

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Background: Serratus anterior plane block (SAPB) is a frequently preferred in breast surgeries due to its prolonged duration of action, wide block coverage, and low risk of severe complications related to procedure. Local anesthetics (LA) can be administered beneath serratus anterior muscle,onto the overlying fascia,or in a combined. Third to sixth intercostal nerves, as well as the long thoracic and thoracodorsal nerves, are blocked. In this report, we aim to present analgesic effects of combined SAPB (CSAPB) administered for perioperative analgesia in three patients undergoing breast-conserving surgery (BCS).

Case Report: After monitoring with ASA standards, they were intubated following induction. In supine position, patients underwent ultrasound-quided CSAPB on operative side with a singleneedle insertion. First, deep SAPB (15 mL of 0.25% bupivacaine) was administered, followed by superficial SAPB (15 mL of 0.25% bupivacaine). Intraoperative remifentanil dose was titrated between 0.05-0.25 mcg/kg/min, considering 20% change in baseline mean arterial pressure or heart rate. For postoperative multimodal analgesia, patients were given 50 mg IV dexketoprofen and 100 mg IV tramadol. Demographic data, intraoperative vital signs, remifentanil usage, postoperative pain levels (visual analog scale: VAS), and additional analgesic requirements were recorded. All patients were female with an average age of 57.6 years and average body mass index (BMI) of 27.3 kg/m2. They were all ASA II. Average surgery duration was 118 minutes, average remifentanil use was 283 mcg, and the average postoperative VAS scores were recorded as follows: 1st hour: 1.66,2nd hour: 1.33,8th hour: 124th hour-1

No block-related complications developed in any patient. Postoperative vital signs were stable, and no additional analgesic was required.

Case	Age (Year)	Gender	BMI (kg/m²)	ASA	Surgery duration (min)	Remifentanyl dosage (mcg)
1	46	Woman	26	II	120	250
2	62	Woman	29	II	116	400
3	65	Woman	27	Ш	118	200

Discussion: Severe postoperative pain is common after chest wall surgeries, potentially leading to complications like atelectasis. Effective pain management reduces these risks. CSAPB was effective in alleviating acute pain post-BCS and is safe,easily performed technique under ultrasound guidance.

References:

1.Chai,doi:10.1007/s40122-022-00456-z 2. Xie, Cuiyu,doi:10.21037/apm-20-1542

Learning points: Postoperative Analgesia, Combined Serratus Anterior Plane Block

12AP08-7

Combined spinal anaesthesia with hypobaric bupivacaine and erector spinae plane block (ESPB) for microwave ablation of a T9 osteoid osteoma in the prone position in a patient with opioid use disorder

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Background: Osteoid osteomas are benign tumors that involve the long bones and spine. Microwave ablation (MWA) under CTguidance is gradually being established as a treatment option for osteoid osteoma, delivering high-energy electromagnetic waves reaching temperatures up to 150° C, leading to coagulative necrosis. This procedure must be performed under general or regional anaesthesia.

Case Report: 43 year old man with an osteoid osteoma in the T9 left transverse process, scheduled for MWA in the prone position. BMI 15.8 kg/m², smoker, ocasional alcohol drinker, history of illegal drug abuse, taking prescription opioids for pain (tramadol and codein), paracetamol and diazepam. Before entering the Interventional Radiology room and after administering 2mg i.v. midazolam we performed an ultrasound guided left erector spinal plane block (ESPB) at T9, with 20 mL 0,25% L-bupivacaine. Afterwards, just before standing in the prone position, an hypobaric spinal anaesthesia was administered, with 6mg 0.5% L-bupivacaine and 10 mcg fentanyl diluted in sterile distilled water to a total of 4 mL. Propofol TCI at 2 mcg/ml was started after positioning the patient, and the ablation was performed uneventfully, with the patient mantaining spontaneous breathing comfortably in the prone

Discussion: Patients with opioid use disorder are more likely to have inadequate postoperative relief from acute pain, and perioperartive multimodal opioid-sparing techniques are recommended. In addition, general anaesthesia in the Interventional Radiology room can be challenging due to the limited room for the equipment. We performed a hypobaric spinal anaesthesia with 6mg of 0.15% L-bupivacaine, with the purpose of blocking only dorsal sensory roots in the prone position. In addition, the ESPB would bring additional intraoperative sensory block and provide postoperative analgesia.

References:

Paliwal N, et al. Spinal Anaesthesia Using Hypobaric Drugs: A Review of Current Evidence. Cureus 2024;16(3):e56069. Cazzato RL, et al. Percutaneous microwave ablation of bone tumors: a systematic review. Eur Radiol 2021;31(5):3530-3541.

Learning points: The sum of a hypobaric spinal anaesthesia and a thoracic ESPB is a good choice in patients undergoing percutaneous painful procedures in the low thoracic spine, avoiding general anesthesia and maintain spontaneous breathing, and providing adequate intra and postoperative analgesia as part of a multimodal opioid-sparing regime.

12AP08-8

Is spinal anesthesia always to blame? A tale of two cases

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Background: Spinal anesthesia is a widely used technique due to its safety and faster recovery. However, rare neurological complications can be severe¹. But not all postoperative complications can be attributed to the procedure2.

This report presents two cases where symptoms initially seemed related to spinal anesthesia but were ultimately linked to other conditions, emphasizing the importance of thorough evaluation and prompt diagnosis.

Case 1: A 28-year-old male, classified as ASA 1, underwent spinal anesthesia for anal fissure surgery. Eight days later, he presented with persistent headaches. Examination findings inconsistent with a typical post-spinal headache prompted cranial imaging. Diffusion MRI showed restricted diffusion, while lumbar puncture revealed elevated cerebrospinal fluid (CSF) protein levels. PCR analysis of the CSF confirmed Mycobacterium tuberculosis. Spinal MRI subsequently identified Pott disease. Anti-tuberculous therapy and neurosurgical stabilization were initiated, leading to significant improvement.

Case 2: A 42-year-old male, classified as ASA 2, underwent spinal anesthesia for anal abscess drainage. Two days later, he presented with new-onset right thigh pain and difficulty mobilising. Neurological examination revealed radicular pain in the L1-L3 region. A possible nerve root compression or pelvic pathology was suspected. Lumbar MRI showed no abnormalities, but pelvic MRI identified an obturator abscess extending to the anal region. Interventional radiology successfully drained the abscess, and the patient showed significant improvement upon discharge.

Discussion: Spinal anesthesia carries risks such as headaches and neurological complications, but these complications can obscure serious underlying conditions. Both cases highlight the importance of accurate assessment, detailed history-taking, and timely imaging in differentiating procedure-related complications from unrelated pathologies.

References:

1. Parnass SM, Schmidt KJ. Adverse effects of spinal and epidural anaesthesia. Drug Saf. 1990 May-Jun;5(3):179-94. 2. Hewson DW, Bedforth NM, Hardman JG. Spinal cord injury arising in anaesthesia practice. Anaesthesia. 2018 Jan;73 Suppl 1:43-50

Learning points:

- Not all postoperative symptoms stem from spinal anesthesia.
- Thorough evaluation, including imaging and history-taking, is essential for accurate diagnosis.
- Multidisciplinary collaboration ensures optimal outcomes for complex cases.

12AP08-9 Intrathecal hydromorphone for postoperative pain management in gastrectomy

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Background: Current guidelines recommend regional anesthesia as a fundamental component of multimodal analgesia for gastrectomy. Single-dose intrathecal hydromorphone or transversus abdominis plane (TAP) block has emerged as alternative options. However, the optimal dose of intrathecal hydromorphone in gastrectomy remain unclear.

This study aims to determine the effective dose 95% (ED95) of intrathecal hydromorphone, as well as to compare its analgesic efficacy with the TAP block following gastrectomy.

Methods: A double-blind sequential allocation trial using up-down design determined the ED95 dose of intrathecal hydromorphone in 51 patients aged ≥18 years undergoing elective gastrectomy (ASA I-III). The starting dose was 50 µg, and responses were assessed using the numeric rating scale (NRS).

A subsequent randomized controlled trial (RCT) enrolled 96 patients meeting the same criteria, randomized to receive either intrathecal hydromorphone (ED95 dose, ITHM group) or TAP block (15 mL of 0.2% ropivacaine per point).

The primary outcome was the area under the curve (AUC) of NRS scores at active within 24 hours post-surgery.

Secondary outcomes included AUCs at various time points at rest or active, analgesic use, adverse events, and recovery outcomes.

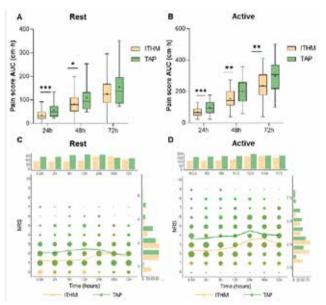


Figure 1: Pain scores AUC and numerical rating scores (NRS) over time for intrathecal hydromorphone versus TAP block.

Results and Discussion: The ED95 dose for gastrectomy was 131.67 μg (95% CI: 113.19–150 μg). In the RCT, 89 patients completed the final modified intention-to-treat analysis. The ITHM group showed a 30% reduction in 24-hour pain score AUCs at active compared to the TAP group (65.0 cm·h vs. 93.0 cm·h, P = 0.001, Figure 1).

Postoperative hydromorphone consumption was significantly lower in the ITHM group at 24 hours (4.2 mg vs. 5.2 mg, P = 0.008)

and 48 hours (8.4 mg vs. 10.0 mg, P = 0.027). No significant differences were observed in recovery outcomes or adverse events between two groups.

Conclusion(s): At the ED95 dose (150 µg), it delivers effective postoperative analgesia for gastrectomy, significantly enhancing pain control and reducing opioid consumption without increasing adverse events.

12AP08-10

ESP block in mastectomy: experience and prospects of use in breast cancer

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Background and Goal of Study: General anesthesia is widely used for radical mastectomy but cannot fully block central nervous system pain signals. High anesthetic doses may lead to PONV, respiratory depression, and poor outcomes. Mastectomy is highly traumatic, necessitating effective pain management. To evaluate if ESP block enhances postoperative pain control, reduces analgesic use, and accelerates recovery in breast cancer

Materials and Methods: Forty adult women undergoing mastectomy were included. Exclusion criteria: severe chest injuries, drug allergies, and refusal to participate. Patients were randomized into two groups: standard general anesthesia (control) vs. anesthesia + ESP block (MCA+ESP). Pain was assessed using the Visual Analogue Scale (VAS), with Promedol administered if VAS exceeded 4. The ESP block (30 ml 0.75% Ropivacaine) was quided by ultrasound at Th5–Th6.

Results and Discussion: ESP block significantly reduced VAS scores and opioid consumption. Pain relief was sustained postoperatively, improving mobility and rehabilitation markers at 12 and 24 hours (e.g., sitting up, deep breathing, raising arms). This technique showed superior postoperative outcomes, minimized risks, and enhanced recovery compared to the control group.

Conclusion: ESP block is effective in mastectomy anesthesia protocols, reducing pain and opioid reliance while accelerating recovery. Ultrasound guidance ensures precision and safety, enhancing patient outcomes and guality of life.

References:

surgery.

- 1. Atlas of Regional Anesthesia: David L. Brown
- 2. doi: 10.1016/j.bjae.2022.08.003 Anaesthesia for awake breast surgeryDL Hamilton $^{\rm 1.2}$, A Pawa $^{\rm 3.4}$
- 3. doi: 10.1186/s12871-021-01277-x. Analgesic efficacy and safety of erector spinae plane block in breast cancer surgery: a systematic review and meta-analysis Ying Zhang ¹, Tieshuai Liu ¹, Youfa Zhou ¹, Yijin Yu ¹, Gang Chen ²

12AP08-11

Comparison of respiratory effects of interscalene and superior trunk blocks as sole anesthetic techniques for shoulder arthroscopy: a randomized controlled trial

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Background and Goal of Study: Interscalene brachial plexus block (ISB) is the "gold standard" for shoulder surgery but involves a high risk of hemidiaphragmatic paralysis (HDP) due to phrenic nerve involvement¹.

Superior trunk block (STB) has emerged as a potential alternative brachial plexus block for analgesia that minimizes respiratory impairment².

We aimed to compare the respiratory effects of ultrasound (USG) guidedISB and STB for shoulder arthroscopy.

Materials and Methods: After approval of the ethics committee, 118 patients scheduled for elective shoulder arthroplasty were enrolled in this prospective observer-blinded study. Patients were randomly assigned to two groups to perform USG-guided either ISB or STB using 25 mL of 0.5% bupivacaine.

Respiratory outcomes were assessed pre- and post-block 30th minute, including diaphragm excursion (DE) and spirometry values (FEV1: Forced Expiratory Volume in 1 second, FVC: Forced Vital Capacity, and FEV1/FVC). HDP was graded based on DE reduction. Secondary outcomes included analgesic efficacy, patient satisfaction, and complications. Surgical anesthesia was successful without general anesthesia support.

Results and Discussion: The demographic data was comparable between the groups. The DE reduction was significantly higher in the ISB group compared to the STB group both in normal and deep breathing (63.67% vs. 24.18% and 63.84% vs. 23.67%; p <0.001).

The incidence of HDP was higher in the ISB group (96.6% vs. 37.3%; p <0.001). FEV1, FVC, and FEV1/FVC reductions were more significant in the ISB group (33.40%, 30.17%, and 4.27%) compared to the STB (20.04%, 19.99%, and 0.28%; p <0.001). No patients required rescue analgesia.

Despite the pulmonary function differences, time to first analgesic request and patient satisfaction were similar between groups. The STB demonstrated a superior safety profile with fewer respiratory and neurological complications in patients undergoing shoulder arthroscopy.

Conclusion(s): The USG-guided STB provides an effective and safer alternative to ISB for shoulder arthroscopy to achieve surgical anesthesia. STB preserves respiratory function and reduces HDP incidence, making it a safer option for patients at risk of respiratory complications, such as those with chronic obstructive pulmonary disease, asthma, or obesity.

12AP08-12

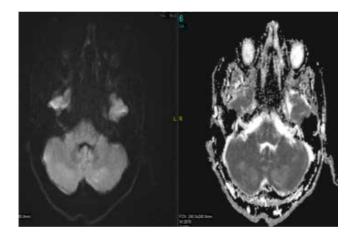
From post-dural puncture headache to posterior reversible encephalopathy syndrome: a case report

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Background: Post-dural puncture headache (PDPH) occurs after dural puncture during spinal anesthesia, within 24-48 hours. The headache is fronto-occipital and worsens with upright posture. Rare complications include subdural hematoma, cerebral venous sinus thrombosis, Reversible Cerebral Vasoconstriction Syndrome (RCVS), and Posterior Reversible Encephalopathy Syndrome (PRES) (1).

This report discusses a PDPH patient later diagnosed with PRES. **Case Report:** A 19-year-old male with no significant medical history underwent pilonidal sinus surgery with spinal anesthesia. Six hours postoperatively, he developed nausea, vomiting, and a headache, diagnosed as PDPH. Conservative treatment was initiated.

On the second postoperative day, he developed blurred vision and seizure-like symptoms. Brain CT revealed extra-axial dense areas. Diffusion MRI showed vasogenic edema in both cerebral hemispheres and occipital regions, raising suspicion for PRES.



Spinal MRI showed no CSF leakage, and MR Venography without thrombosis. MR Angiography showed no major arterial occlusion. Antiepileptic treatment was started. Imaging showed no progression, symptoms improved, and he was discharged on day 6. A follow-up MRI showed regression, confirming the PRES diagnosis.

Discussion: PDPH is typically treated conservatively, but neurological symptoms like those seen in PRES can indicate serious complications.

PRES is a rare syndrome characterized by headache, visual disturbances, and seizures, often associated with blood-brain barrier dysfunction, cerebral edema and disrupted cerebral autoregulation.

MRI shows symmetrical vasogenic edema in the parieto-occipital regions and subcortical white matter (2).

References:

1. Schyns-van den Berg AMJV, et al. Postdural puncture headache: Revisited. Best Pract Res Clin Anaesthesiol. 2023 Jun;37(2):171-187. 2. Pilato F, et al. Posterior Reversible Encephalopathy Syndrome and Reversible Cerebral Vasoconstriction Syndrome: Clinical and Radiological Considerations, Front Neurol, 2020 Feb. 14:11:34.

Learning Points: Understand the importance of evaluating neurological symptoms in PDPH patients to early diagnose and manage serious complications like PRES.

12AP09-1

Use of three-dimensional spine reconstruction to guide perivertebral thoracic epidural insertion - a prospective observational pilot study

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Background and Goal of Study: Thoracic epidural (TEA) inserted via palpation techniques has a failure rate of 3-11%. Use of CT to pre-plan surgical procedures has become increasingly popular.

We hypothesized that by employing similar principles and technology we could create a 3D model, plan the optimal insertion site and angle for TFA.

Materials and Methods: Using a 3D model of a patient's CT scan, the TEA insertion site was planned by marking a tract from the epidural space to the skin avoiding bony structures. The skin insertion site of the tract was measured as the lateral and caudal distance to the nearest spinous process. This was then marked on the patient and the anesthesiologist was given the angle of the epidural tract.

The primary outcome was successful loss of resistance)LOR) allowing insertion of the epidural catheter. Secondary outcomes were epidural success, defined as a TEA in use on POD 1; the number of epidural insertions; the number of needle re-angulations: needle insertion time.

Results and Discussion: 15 patients underwent TEA with 3D planning. Successful loss of resistance allowing insertion of the epidural catheter, was achieved for all patients. 14/15(93%) epidurals were successful. In one patient the procedure was abandoned due to blood aspirated from the epidural catheter.

LOR was achieved on the 1st attempt in 13/15 (86%), the maximum number of epidural insertions was two (0[0-0]). 8/15 (53%) of patients required zero needle re-angulations, the maximum number of re-angulations was three, O[0-1]. Median time from needle insertion to loss of resistance was 56(37-66.5)[29-119] seconds

This study represents the first utilization of pre-procedure 3D modeling to plan patient-specific optimal TEA insertion sites. Loss of resistance allowing insertion of an epidural catheter was achieved in 100% of patients and 93% of patients had an effective epidural.

Additionally, the number of patients who had an epidural on the first attempt was higher than the departmental average for TEA 86% vs 46%, the number of needle re-angulations was also much less than data for neuraxial anesthesia previously published by our department

Conclusion(s): In this proof of concept study we have shown that it is possible to successfully pre-plan the epidural insertion site and angle from a 3D model of CT images. This represents a critical step in the development of CT guided navigation for TEA and potentially other invasive anesthesia procedures.

12AP09-2

Peng block as part of multimodal analgesia for pain management in hip arthroplasty

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Background and Goal of Study: Total hip arthroplasty is one of the most common and frequent orthopedic procedure. Effective pain management after total hip arthroplasty is essential for early rehabilitation, patient satisfaction, and functional recovery.

Materials and Methods: We conducted a retrospective analysis with the aim of evaluating the analgesic quality of a multimodal analgesia program in patients who underwent total hip arthroplasty over a period of 6 months. A total of 30 patients were included, all of whom received intradural anesthesia combined with a PENG block. The following data was evaluated during the first 48 postoperative hours: ENA scale, analgesic medication used, milligrams of dexamethasone administered, opioid consumption, side effects, recovery time from the anesthetic block, time to the onset of sitting and ambulation, and length of hospital stay.

Results and Discussion:

- 76.6% received a complete multimodal analgesic treatment, which consisted of the administration of an analgesic (paracetamol), a NSAID (dexketoprofen or ibuprofen), and intraoperative dexamethasone, along with the performance of a PENG block (levobupivacaine 0.25%, 20 ml).
- 60% of the patients received a dose of dexamethasone ≥ 10 mg. The average dose used was 13.4 mg.
- In 90% of cases, the PENG block was performed before the surgery.
- The average morphine consumption per patient during the first 48 hours was 1.5 mg IV. In patients with complete treatment who received a dose of dexamethasone ≥ 10 mg, the average morphine consumption was 2.31 mg.

	In PACU	24h	48h	
Mild pain	82,6%	47,8%	100%	
Moderate-to-severe pain	17,4%	51,2%		
Patients with INCOMPLETE	multimodal analge	esic treatment (23.3%)		
	In PACU	24 h	48 h	
Mild pain	71,4%	57,1%	71,4%	
Moderate-to-severe pain	28.6%	42,9%	28,6%	

Conclusion(s): We observed that the PENG block is a safe and effective block. However, further studies are still needed to determine the optimal timing and dosage for its administration.

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12AP09-3

Stellate ganglion block: the future treatment for electrical cardiac storms - case report

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Background: Electrical cardiac storms, characterized by rapid recurrence of episodes of ventricular tachycardia (VT) or ventricular fibrillation (VF), are life-threatening medical emergencies difficult to treat. Current pharmacological treatment (amiodarone, beta-blockers) have limitations regarding their effectiveness[1,2]. Increasingly evidence suggests that ultrassound guided stellate ganglion block (SGB) (cervical sympathetic chain) with a local anesthetic (Moore technique) may be a treatment option, and without limitations regarding the patient's anticoagulation status[1]. We present a case of a patient with electrical storm treated with stellate ganglion block.

Case Report: A 69-year-old male patient with a past medical history of atrial fibrillation (on dabigatran anticoagulation), heart insufficiency (EF 49%), alcohol and tobacco consumption, type II diabetes mellitus and benign prostatic hyperplasia (BPH), was admitted for revascularization angioplasty after an inferolateral STEMI.

On the 4th day of hospitalization, developed septic and cardiogenic shock, electrical storm with multiple episodes of VT and cardiac arrest with ROSC after 40 minutes of advanced life sup-

On the 7th day of hospitalization, was proposed a ultrasoundguided left-sided SGB. With a 30 mm needle, lidocaine 2% 5 mL and bupivacaine 0.25% 5 mL, were administered without compli-

Confirmation of the block was achieved by immediately observing miosis, hyperemia, and increased skin temperature on the blocked side. Three VT episodes were recorded within 24 hours after the SGB, hemodynamic stability was achieved and no further dysrhythmic episodes were observed subsequently.

Discussion: SGB is an effective, minimally invasive and with low risk of complications technique for recurrent VT/VF. Currently, it's not included in the guidelines, with the potential to be part of the treatment for refractory VT/VF[1,2].

References:

1. Sahoo, R. K., Kar, R., Dev, I., Kumar, M., Parida, A. K., & Ganguly, A. (2021). Stellate ganglion block as rescue therapy in drugresistant electrical storm. Annals of Cardiac Anaesthesia, 24(3), 415-418;

2. López-Millán Infantes, J. M., Coca-Gamito, C., Cámara-Faraig, A., Díaz-Infante, E., & García-Rubira, J. C. (2024). Stellate ganglion block for the management of electrical storm: An observational study. Revista Espanola de Anestesiologia Y Reanimacion, 71(1), 1-7.

Learning Points: SGB could be a promising treatment for electrical cardiac storms.

12AP09-5

Comparative evaluation of analgesic efficacy of the ultrasound guided erector spinae plane(ESP) block versus transversus abdominis plane(TAP) block in children undergoing unilateral abdominal surgeries: a prospective randomised controlled trial

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Background and Goal of Study: Pain in children, especially infants are frequently underestimated with the assumption that the immature nervous system protects against acute pain experience. However, recent studies reveal that physiological instability. altered neurodevelopment, and decreased pain threshold are a sequelae of pain exposure in early development.

Currently, multimodal analgesia with caudal block is the primary management for paediatric acute post-operative pain.

Regional anaesthesia techniques such as Transversus abdominis plane (TAP) block and Erector spinae plane (ESP) block have been shown to provide excellent analgesia and decrease the use of peri-operative opioid requirements. TAP block provides analgesia for somatic and parietal pain, sparing visceral nerves, while ESP block provides somatic and visceral analgesia.

Therefore, this study aims to evaluate the analgesic efficacy of ultrasound-guided ESP block as compared to TAP block in the first 24 hours in children undergoing unilateral abdominal surgeries.

Materials and Methods: Seventy patients between 6 months-12 years of age, ASA physical status I and II were included in the study. Patients randomised into Group E (n= 35 patients) and Group T (n= 35 patients) received ultrasound-guided unilateral ESP block and unilateral TAP block respectively using 0.5ml/kg of 0.25% Ropivacaine plus Clonidine1µ/kg after general anaes-

Primary objective was to compare the duration of analgesia (time to first rescue analgesia requirement) of ultrasound-guided ESP Vs TAP block in children undergoing unilateral abdominal surger-

The secondary objectives were the trend of intraoperative hemodynamic parameters, total fentanyl consumption in the first 24 hours, FLACC scores at 0, 2hrs, 4hrs, 6hrs, 12hrs and 24 hours in children up to 7 years and VAS scores at the same point of times in children more than 7 years, duration of putting block (needling time), parental satisfaction and incidence of any side effects.

Results and Discussion: The median (IQR) time to first rescue analgesia requirement was 30 min (30min-120min) in Group E and 30 min (30min -75min) in Group T (p = 0.725) which was comparable in both the groups. The total fentanyl consumption was comparable in both groups.

Conclusion(s): The ESP and TAP Block are both equally effective modalities for perioperative pain management in paediatric patients undergoing unilateral abdominal surgeries.

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12AP09-6

The role of rectus sheath block in high-risk patients undergoing peritoneal dialysis catheter placement: a case report

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Background: Perioperative care for patients undergoing peritoneal dialysis catheter (PDC) placement surgery is challenging due to associated serious comorbidities.

This case report demonstrates that regional anesthesia may offer a safe and effective option for those with complex cardiovascular and renal conditions.

Case Report: A 71-year-old male, ASA IV, 76 kg, with sarcoidosis, hypertension, atrial fibrillation, pulmonary hypertension (pulmonary artery systolic pressure 63mmHg) with right heart failure, end-stage chronic kidney disease secondary to refractory cardiorenal syndrome, and chronic obstructive pulmonary disease, underwent PDC placement surgery.

Anesthesia management consisted of left rectus sheath block (RSB) with a total of 20 mL of 0.5% ropivacaine (100 mg) administered as a single shot. Additional 10mL of 2% lidocaine was administered in the lateral zone of the incision by the surgeon. This was supplemented with sedation using midazolam 1mg and ketamine 20mg. Intraoperative and postoperative periods were uneventful

Discussion: Previous literature supports the challenges of anesthesia in patients undergoing PDC placement, emphasizing tailored strategies to minimize cardiovascular stress and optimize renal outcomes. The RSB provided effective analgesia, however, due to its limited coverage, there was the need for additional local infiltration. Sedation with ketamine was preferred due to its minimal hemodynamic impact, which is crucial in patients with significant cardiovascular compromise.

This case underscores the viability of regional anesthesia in high-risk patients undergoing PDC placement. Combining other regional techniques, namely the TAP Block, may enhance patient comfort and further improve safety in complex cases.

References:

Haro, E.S; et al; Bilateral rectus sheath block as the sole anesthetic technique for urgent incarcerated umbilical hernia repair. Rev. Chil. Anest. 2023

Li, J, et al; US-guided unilateral TAP combined with RSB vs. subarachnoid anesthesia in patients undergoing peritoneal dialysis catheter surgery; J of Pain Research, 2020

Learning Points: Regional anesthesia with sedation, is a safe and effective option for high-risk patients undergoing PDC placement.

Personalized anesthesia strategies, emphasizing hemodynamic stability and effective analgesia, are crucial for managing patients with complex comorbidities.

12AP09-7 Lost in epidural space: a tipless tale

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Background: Epidural anesthesia is a widely used neuroaxial technique, known for its analgesic effectiveness and safety profile. Among the rare complications associated with the epidural technique, catheter entrapment and knotting stands out, with an occurrence rate of 0.0015%, while catheter breakage occurs in approximately 0.002% of cases.

Case Report: 76-year-old male, ASA status II, was scheduled for left knee arthroplasty. A combined epidural-spinal anesthesia was performed, proceeding without complications. At the end of the surgery, an attempt to administer a test dose via the epidural catheter was unsuccessful due to high pressure during administration.

The catheter was then removed, although requiring much more resistance than usual, ending up broken, with the tip left inside. Neurosurgery team was consulted, and it was decided to maintain monitoring.

Subsequently, an ultrasound continuous femoral nerve block was performed for postoperative analgesia. The patient remained stable in the postoperative period, with controlled pain and without referring other symptoms.

Discussion: According to the literature, the main causes of epidural catheter entrapment and breakage include: catheter defect, knot formation, multiple insertion attempts, and excessive catheter length in epidural space.

When the catheter becomes trapped in the epidural space, it is recommended to wait 15 to 30 minutes to allow tissue relaxation. The patient should be placed in the same position during insertion.

Before attempting removal again, an injection of saline should be tried. An unsuccessful saline test bolus indicates a knot at the catheter tip. In this case, the insertion technique was achieved on the first attempt. However, during the catheter extraction, the patient's positioning was not optimized, which could have facilitated catheter removal and prevented breakage.

On the other hand, the failure of the saline injection suggests the presence of a knot. In the presence of epidural catheter breakage, most studies show that imaging exams are unable to locate the retained catheter.

In the absence of symptoms, only monitoring is recommended, as it is an inert and sterile material, and surgical exploration may be more harmful than beneficial. However, follow-up should be maintained for months or even years.

Reference:

Khadka B, et al. Removing knotted or stuck epidural catheters: a systematic review of case reports. Anesth Pain Med 2023; 18:315-324

12AP09-8

The effect of four-point Transversus Abdominis Plane block on diaphragm thickness in patients undergoing laparoscopic cholecystectomy: a randomized controlled trial

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Background and Goal of Study: After laparoscopic cholecystectomy, postoperative respiratory dysfunction is often associated with impaired diaphragm movement due to pain. The four-point Transversus Abdominis Plane (TAP) block, targeting upper abdominal pain, may positively affect diaphragm thickness by reducing postoperative pain.

This study aims to evaluate the effect of the four-point TAP block on diaphragm thickness.

Materials and Methods: The study included patients aged 18-65 years with an ASA I-II undergone for laparoscopic cholecystectomy. Following randomization, Group B received a four-point TAP block postoperatively, while Group C did not receive any interventional treatment.

In Group B, 10 ml of 0.25% Bupivacaine was administered under ultrasound guidance to the upper abdomen (T6-T9) and the bilateral typical TAP regions (T10-T12).

The primary outcome measure was diaphragm thickness (DT), assessed via ultrasonography preoperatively and at 5 and 30 minutes post-extubation.

Secondary outcome measures included Visual Analog Scale (VAS) scores and Quality of Recovery-15 (QoR-15) scores.

Results and Discussion: A total of 86 patients were enrolled in the study (Group B=43, Group C=43). At 5 minutes post-extubation. DT in both the inspiratory and expiratory phases showed no statistically significant differences between the groups (p=0.523 and p=0.057, respectively).

At 30 minutes post-extubation, expiratory DT was also not significantly different between the groups (p=0.394). However, at the same time point, inspiratory DT was significantly higher in Group B (4.60±0.62 mm) compared to Group C (4.34±0.40 mm, p=0.025).

VAS scores at 5 and 30 minutes, as well as at 2, 8, and 24 hours postoperatively, were significantly lower in Group B compared to Group C (p<0.05).

Additionally, QoR-15 scores were significantly higher in Group B (131.39±4.91) than in Group C (114.51±11.36, p<0.001), indicating better recovery quality in Group B.

Conclusion(s): Our study demonstrates that the four-point TAP block preserves diaphragm thickness and improves pain management in the postoperative period.

These findings suggest that the TAP block is effective in pain control through its impact on the diaphragm. However, further studies with larger sample sizes are needed to confirm and expand upon these findings.

12AP09-10

Minimal dose, maximum safety: continuous spinal and peripheral nerve blocks for femur surgery in a high-risk patient

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Background: Continuous spinal anesthesia (CSA) allows precise titration of local anesthetics, ensuring optimal surgical conditions with minimal sympathetic blockade. Peripheral nerve blocks (PNBs) reduce the need for intrathecal anesthetics and opioids. enhancing safety for elderly patients with complex comorbidities, such as cardiac, respiratory, and renal dysfunction.

Although spinal anesthesia has been contraindicated in severe aortic stenosis (AS), CSA offers greater hemodynamic stability compared to single-shot spinals, making it a viable option for these patients.1,2

Case Report: An 86yo woman, ASA IV, was admitted for delayed emergency femur fracture repair. Her history included severe AS (aortic valve area 0,88 cm²), ischemic coronary artery disease, hypertension, atrial fibrillation (on anticoagulation), bifascicular block (with a pacemaker), asthma, pulmonary hypertension (pulmonary artery systolic pressure 65mmHg), and chronic kidney disease. Surgery was delayed due to intestinal ischemia caused by hypoperfusion and anemia requiring transfusion.

In the operating room, ASA standard monitoring was supplemented with invasive blood pressure monitoring. Premedication included 50mcg fentanyl and 1mg midazolam. Ultrasound-guided femoral and lateral femoral cutaneous nerve blocks were performed with 75mg ropivacaine (20mL 0,375%).

An intrathecal catheter was placed at L2-L3 and 2,5mg of hyperbaric bupivacaine were administered. 2 hours into surgery, perineal discomfort due to limb traction prompted an additional 1mg intrathecal bupivacaine, 20mcg IV fentanyl and 1g paracetamol.

The patient remained hemodynamically stable throughout and after surgery, requiring no vasopressor support, and was discharged 4 days later without complications, including no postdural puncture headache.

Discussion: Timely hip fracture repair is essential for improving outcomes, and this case underscores the value of combining CSA with PNBs to provide a tailored approach for frail patients with multiple comorbidities, thereby minimizing the risk of hemodynamic instability.

References:

- 1. Hay R, Gupta A. Continuous spinal anesthesia. BJA Educ. 2022;22(8):295-297.Tabrizi NS, et al.
- 2. Neuraxial anesthesia in patients with aortic stenosis: a systematic review. J Cardiothorac Vasc Anesth. 2024 Feb;38(2):505-516

Learning points: CSA provides precise anesthetic control and hemodynamic stability and PNBs reduce intrathecal anesthetic and opioid use enhancing safety in high-risk patients.

Regional Anaesthesia

12AP09-12

Urgent fournier's gangrene surgical debridement managed with continuous spinal block

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Background: Fournier's gangrene consists of a polymicrobial infection of the soft tissues of the perineum, which may cause significant systemic involvement, resulting in high mortality in the perioperative period. The anesthetic approach is particularly challenging in this patients, considering the various comorbidities they present but also the multiorgan dysfunction that often develops in this context.

Case Report: We present a 75 year old man proposed for urgent surgical debridement of Fournier's gangrene. The patient had ischemic heart disease with previous angioplasty, poorly controlled diabetes mellitus with end organ damage, namely diabetic nephropathy undergoing scheduled hemodialysis and peripheral artery disease with bilateral infragenicular amputation.

After hemodynamic stabilization and monitoring, we opted for a continuous spinal block, where intermittent boluses of 2.5 mg Bupivacaine were administered. After this time a bolus of 2.5mcg of Sufentanil was administered to improve the quality of the sensory block.

An intravenous bolus of ketamine (10mg) was used to complement the anesthetic approach. The patient remained hemodynamically stable during the procedure, with vasopressor support (noradrenaline) infusion (maximum 0,32 mcg/kg/min).

Discussion: The preoperative evaluation of a patient with Fournier's gangrene is complex and there are several factors to take into consideration, namely the patient's physical state, comorbidities, degree of multiorgan dysfunction and extent of the lesion. The literature is scarce regarding anesthetic approaches in this context but does not seem to demonstrate superiority of any anesthetic technique. Given this patient's frailty, we considered that a continuous spinal anesthesia would be the anesthetic technique with the least hemodynamic impact, allowing titrated administration of local anesthetic.

Reference:

Boran ÖF, et al. Are there factors in the disease of peroneal necrotizing fasciitis which should be used when choosing the anesthetic technique?: Descriptive analysis of a cohort from two centers. Ulus Travma Acil Cerrahi Derg. 2022 Jan;28(1):48-56. doi: 10.14744/tjtes.2020.15088.

Learning points:

- Patients with Fournier's gangrene often present multiple comorbidities and multiorgan dysfunction, which contributes to the complexity of the anesthetic-surgical approach;
- Continuous spinal anesthesia is an effective anesthetic strategy for surgical debridement of Fournier's gangrene.

12AP10-1

Innovative analgesia for major abdominal surgeries: the role of ESP blocks

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Background: Hepatopancreatobiliary (HPB) surgeries are associated with a significant risk of complications, often exacerbated by inadequate postoperative pain control. While epidural analgesia remains a widely used and effective technique, continuous erector spinae plane (ESP) blocks have emerged as a promising alternative, with fewer side effects.

We present a series of three cases demonstrating the effectiveness of ESP blocks in managing pain for major HPB procedures.

Case Report: The first case involved a 51-year-old obese male (ASA III) with a history of acute myocardial infarction four months prior, still on dual antiplatelet therapy, scheduled for an open cephalic duodenopancreatectomy.

The second case was a 32-year-old female (ASA I) diagnosed with a tumor of the pancreatic tail, planned for laparoscopic corpus-caudal pancreatectomy.

The third case featured a 77-year-old male (ASA III) with hypertension, dyslipidemia, atrial fibrillation, and obstructive sleep apnea syndrome managed with C-PAP, diagnosed with cholangio-carcinoma, and scheduled for open cholecystectomy with partial resection of the common hepatic duct.

After discussing risks and obtaining informed consent, patients were positioned seated, and bilateral ESP blocks were performed at the T6–T7 level. A catheter was placed on the right side for continuous analgesia. General anaesthesia was subsequently induced. Surgeries lasted 3 to 4 hours without complications. During the procedures, 120 mg of 0.2% ropivacaine was administered in three boluses.

Postoperatively, additional ropivacaine boluses ensured effective pain control. No opioid rescues were necessary in the post-operative period

Discussion: These cases illustrate the feasibility and efficacy of ESP blocks in providing perioperative analgesia for abdominal surgeries, even in patients with complex medical conditions.

References:

1. Nair S, McGuinness S, Masood F, Boylan JF, Conlon NP. Erector Spinae Plane Blocks in Major Hepatopancreaticobiliary Surgery: A Case Series. A A Pract. 2019 Nov 1;13(9):332-334.

2. Cai Q, Liu Q, Huang LS, Yang ZX, Gao ML, Jing R, Liu Z, Pan LH. Effects of erector spinae plane block on postoperative pain and side-effects in adult patients underwent surgery: A systematic review and meta-analysis of randomized controlled trials. Int J Surg. 2020.

Learning Points: Continuous ESP block may offer a simpler and potentially safer alternative to epidural block for perioperative analgesia in major HBP surgeries.

Elderly heart, delicate hands: peripheral regional anesthesia in severe aortic stenosis, a case report

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Background: Severe aortic stenosis (AS) is a critical condition that significantly increases perioperative risks, especially in elderly patients1.

This case underscores the importance of individualized perioperative strategies and the role of regional anaesthesia in optimizing outcomes for high-risk elderly patients.

Case Report: A 90-year-old woman, ASA IV, with a right femoral neck fracture was scheduled for a short intramedullary nailing fixation. Her medical history included hypertension and severe aortic valve disease, with a maximum transvalvular gradient of 90 mmHg. During the pre-anesthetic visit, the patient presented with new-onset atrial fibrillation which was successfully managed with digoxin and bisoprolol.

Intraoperatively, standard ASA monitoring was used and peripheral regional anesthesia was chosen to mitigate the risks associated with neuraxial and general anesthesia.

An ultrasound-guided supra-inguinal fascia iliaca block (SIFIB) was performed with 15 ml of ropivacaine (7.5 mg/mL) and 10 ml of lidocaine (10 mg/mL) for effective hip anesthesia. Multimodal analgesia was administered. She was hemodynamically stable throughout the surgical procedure.

Postoperatively, the patient was transferred to the Post-Anesthesia Care Unit for further monitoring. She did not require rescue analgesia, indicating effective pain control.

Discussion: Intramedullary nailing fixation for femoral neck fractures provides significant benefits, including reduced bedrest duration and enhanced functional recovery. The SIFIB, typically used for perioperative analgesia, can serve as the primary anesthetic approach for this surgical procedure, offering effective sensory blockade with minimal sympathetic impact².

This case highlights the challenges of managing elderly patients with severe comorbidities for urgent orthopedic surgery. The chosen anesthetic approach ensured both hemodynamic stability and optimal anesthesia and analgesia throughout the procedure.

References:

- 1. Sundararajan, V. et al. (2005). Anesthetic implications of severe aortic stenosis. Journal of Clinical Anesthesia, 17(4), 279-284.
- 2. Genc C, Tulgar S. "Ultrasound-Guided Suprainguinal Fascia Iliaca Block in Anesthesia for Lower Extremity Surgeries: A Retrospective Cohort Study." Cureus, 2023.

Learning points: Regional anesthesia, such as SIFIB, ensures effective anesthesia and pain control while reducing hemodynamic instability, making it an optimal choice for managing high-risk elderly patients.

12AP10-3

Bilateral proximal humeral shaft fractures - phrenic nerve-sparing regional anaesthesia

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Background: The interscalene brachial plexus block (ISB) is considered the gold standard regional anaesthesia approach for shoulder surgery. However, it encompasses potential side effects such as hemidiaphragmatic paralysis due to phrenic nerve block1, hence bilateral ISBs are not typically performed as they might lead to complete diaphragmatic paralysis.

Case Report: We report a clinical case of a blunt trauma patient with bilateral proximal humeral shaft fractures and a left pulmonary contusion, who was scheduled for bilateral osteosynthesis. The anaesthetic plan included ultrasound-guided regional anaesthesia and sedation with propofol.

Firstly, a left ISB was performed with 10mL of 0.5% ropivacaine. After successful osteosynthesis, a right infraclavicular brachial plexus block (ICB) was performed with 20mL 0.5% ropivacaine, associated with a posterior approach suprascapular nerve block (SCNB) with 5mL ropivacaine 0.75%.

A superficial cervical plexus block (SCPB) was also performed with 5mL ropivacaine 0.75% in order to cover the supraclavicular nerves. Supplemental oxygen was provided and the patient did not report any complaints. The procedure was performed uneventfully.

Discussion: Pulmonary contusion is fairly common in the setting of blunt trauma and might progress to atelectasis or acute respiratory distress syndrome².

The association of the ICB with the SCNB has been described as a strategy to minimize hemidiaphragmatic paralysis whilst providing adequate surgical anaesthesia for shoulder surgery³.

The addition of the SCPB provides cutaneous anaesthesia of the shoulder cape. In this clinical case, left pulmonary function was already compromised, hence the advantages of avoiding general anaesthesia and right phrenic nerve block as respiratory failure could be induced.

References:

- 1. Kang, R., & Ko, J. S. (2023). Recent updates on interscalene brachial plexus block for shoulder surgery. Anesthesia and Pain Medicine, 18(1), 5-10.
- 2. Rendeki, S., & Molnár, T. F. (2019). Pulmonary contusion. Journal of Thoracic Disease, 11(S2), S141-S151. https://doi. org/10.21037/jtd.2018.11.53
- 3. Tran, D. Q., Elgueta, M. F., Aliste, J., & Finlayson, R. J. (2016). Diaphragm-Sparing Nerve blocks for shoulder surgery. Regional Anesthesia & Pain Medicine, 42(1), 32-38.

Learning points: The combination of different phrenic nervesparring blocks provides adequate surgical anaesthesia for shoulder surgery in patients with preexisting lung complications.

Locoregional anesthesia, an alternative in elderly patients? A case report

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Background: Perioperative anesthetic and analgesic management in elderly patients is a significant challenge. Regional anesthesia has gained prominence as an effective alternative to general anesthesia and intravenous analgesia, particularly in situations of high fragility1,2.

Case Report: A 71-year-old male with past medical history of hypertension, heart failure, and acute myocardial infarction with cardiopulmonary arrest was initially admitted for urgent surgical debridement of slough and leg burn under general anesthesia. During the initial surgery, severe hemodynamic instability was identified requiring hemodynamic support with vasopressors and recovery in the ICU. Given the need for multiple future interventions, the need for a strategy change and careful anesthetic planning became evident.

For new surgical debridement, revision of pedicled flap and vacuum dressing a preoperative evaluation, reported intense pain, not controlled with intravenous analgesia, indicating as well the need for a distinct analgesic strategy.

Thus, a regional anesthesia technique with peripheral nerve blocks was chosen, after discussion with the patient and surgical team. A Sciatic-popliteal and lateral femoral cutaneous block were performed and a sciatic-popliteal perineural catheter was placed for postoperative analgesia.

As an adjunct, light sedation with dexmedetomidine was used. The perineural catheter was subsequently used to optimize analgesia and perform further surgical procedures, with no further episodes of hemodynamic instability.

Discussion: Literature shows that regional anesthesia is effective in the perioperative period, offering benefits of promoting faster, less painful recovery and reducing opioid consumption3.

This report shows the importance of regional anesthesia in the elderly, demonstrating its advantages in perioperative hemodynamic control and postoperative pain control.

References:

- 1. Partridge, J. S. L., Moonesinghe, S. R., Lees, N., & Dhesi, J. K. (2022). Perioperative care for older people. Age and Ageing, 51(8), 1-6.
- 2. Steadman J, Catalani B, Sharp C, et al. Trauma Surg Acute Care Open 2017;2:1–7.
- 3. Smith, J. A., & Doe, R. B. (2022). Perioperative pain management in the elderly surgical patient. Journal of Anesthesia and Pain Management, 15(3), 123-134.

Learning points: Highlighting the importance of personalized anesthetic strategies, as well as the importance of multidisciplinary collaboration in clinical decision-making.

12AP10-5

Comparison of postoperative pain incidence in patients undergoing oncological mastectomy: general anesthesia vs general anesthesia associated with regional block

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Background and Goal of Study: Oncological mastectomy is one of the most common surgical interventions in the treatment of breast cancer. General anesthesia is the most commonly used technique, and its association with regional blockade has been gaining attention as a promising anesthetic alternative.

The aim of this study was to evaluate the incidence of postoperative pain in the immediate postoperative period in patients undergoing mastectomy with general anesthesia or general anesthesia combined with regional blockade during the study period.

Materials and Methods: This study was conducted in an observational, cross-sectional and retrospective manner between January 2023 and December 2023, at a public hospital unit for oncological patients located in São Paulo, Brazil. Inclusion criteria were patients undergoing oncological mastectomy during the period. Exclusion criteria included patients who underwent autologous breast reconstruction and surgeries from other specialties.

Interpectoral and pectoro serratus regional blocks were performed at the end of the surgical procedure, under ultrasonographic guidance, and the patients were evaluated for the presence of pain in the post-anesthesia recovery unit (PACU).

Results and Discussion: A total of 304 mastectomies were performed during the study period. Only intravenous or balanced general anesthesia was performed in 255 (83.88%) patients, followed by general anesthesia combined with epidural in 37 (12.17%) patients and general anesthesia combined with peripheral blockade in 12 (3,94%) patients.

The regional blocks performed were the interpectoral block and the pectoro serratus block. When evaluating the presence of pain in the PACU, only the patients who received general anesthesia reported pain, with n=47 (15,46%) of total.

Conclusions: This comparative study suggests that the combination of general anesthesia with regional blockade provides superior analgesia compared to isolated general anesthesia in patients undergoing oncological mastectomy when evaluated from the perspective of postoperative pain reduction and, consequently, reduced need for opioid analgesics in the PACU.

However, the study has statistical limitations due to the lower number of patients who received regional anesthesia in comparison, and it does not assess pain and opioid consumption after discharge from the PACU, highlighting the need for more studies in this area to conclude the advantages of one technique over the other.

Pericapsular Nerve Group block versus Fascia Iliaca compartment block for hip surgery: an updated systematic review and meta analysis of 24 randomized controlled trials

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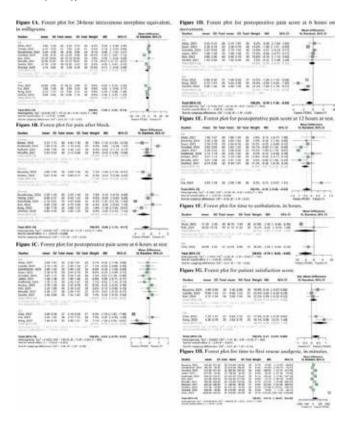
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Background and Goal of Study: Fascia Iliaca (FI) block is a widely used regional technique for hip surgeries. Pericapsular Nerve Group (PENG) block has emerged as an alternative, offering potential improved analgesia and recovery.

This meta-analysis compares PENG versus FI block for patients undergoing hip surgery.

Materials and Methods: We searched PubMed, Embase, and Cochrane until November 2024 for randomized controlled trials (RCTs) comparing PENG and FI blocks.

Our primary outcome was 24-hour postoperative opioid consumption. Secondary outcomes included pain scores after the block, 6- and 12-hours postoperative pain, on movement and at rest, respectively, time to ambulation, patient satisfaction scores, and time to first rescue analgesic. R software, version 4.4.0, was used for mean difference (MD), and standardized mean difference (SMD), in a random-effect model.



Results and Discussion: 24 RCTs. comprising 1.521 patients. were included. PENG block significantly reduced 24-hour postoperative intravenous opioid consumption (MD -2.58 milligrams morphine equivalents [95% CI -4.42; -0.74]; p=0.006, I²= 99%), pain after block (MD -0.66 points [95% CI -1.15; -0.17]; p=0.008, I²= 94%), 6 hours pain on movement (MD -0.70 points [95% CI -1.36: -0.031: p=0.04. I²= 85%), 12 hours pain at rest (MD -0.35) points [95% CI -0.68; -0.02]; p=0.038, I²= 79%), and time to ambulation (MD -4.79 hours [95% CI -8.63; -0.95]; p=0.014, I²= 76%), compared to FI block. Additionally, PENG block statistically increased patient satisfaction score (SMD 0.31 [95% CI 0.01; 0.60]; p=0.041, I²= 46%). No statistical differences were observed 6 hours pain at rest and time to first rescue analgesic.

Conclusion(s): PENG block was associated with significantly lower opioid consumption, 6 hours pain score on movement, 12 hours pain score at rest, and time to ambulation compared to FI block. A statistically higher patient satisfaction score was also noted. No differences were found in time to first rescue analgesic or 6 hours pain at rest.

12AP10-8

When general anesthesia is not an option: belt and brace approach with regional anesthesia for awake radical mastectomy

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Background: Breast cancer is the most prevalent malignancy among women, with an increasing number of older patients presenting for surgical intervention due to longer life expectancy and associated comorbidities.1

Traditionally, modified radical mastectomy is performed under general anesthesia, but peripheral nerve block techniques offer a less invasive alternative that may benefit high-risk patients. 1,2

Case Report: We report an 85-year-old woman, diagnosed with advanced invasive carcinoma of the right breast. The patient presented with multiple comorbidities, including pulmonary hypertension, respiratory failure, heart failure, and others.

Given her high anesthetic risk, a comprehensive regional anesthesia plan was implemented, utilizing a belt and brace technique to block all sensory innervation to the right breast. This included a paravertebral block at three levels, supplemented by intercostal, pectoralis major, supraclavicular nerve blocks, and a pectointerfascial block. To enhance safety, a high thoracic epidural catheter was placed. Due to technical difficulties performing a paravertebral approach in one of the levels an erector spinae plane block was performed as a rescue in T3-T4. This tailored anesthetic strategy resulted in a safe and painless surgical experience.

Discussion: This case illustrates the possibility of a different approach for a common breast surgery. Radical mastectomy with lymph node dissection is usually done under general anaesthesia but in this case we demonstrated that regional techniques are feasible and safe in this type of surgery. In order to perform a locoregional approach in this type of surgery it is mandatory to understand the nerve supply to the breast and the axila. It is essential to suit the anesthetic technique to the patient.

References:

1. Garreffa, E., Cantagalli, F., et al. (2020), Pectoral nerves blocks (PECS) and sedation: A way to avoid general anesthesia in breast surgery - A single institution early experience. Breast J, 26: 303-305;

2. Matsumoto M, Flores EM, Kimachi PP, et al. Benefts in radical mastectomy protocol: a randomized trial evaluating the use of regionalanesthesia. Sci Rep. 2018:8:7815.

Learning points: This case underscores the importance of customizing anesthetic techniques to patient-specific factors, particularly in the geriatric population with significant comorbidities. It highlights the necessity of flexibility in anesthetic planning to ensure optimal care in complex surgical cases.

12AP10-9

Continuous median and radial nerve blocks for hand burn management: a case report

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Background: Burn pain is notoriously difficult to manage. While opioids remain the mainstay, they carry risks such as hyperalgesia, dependence, and systemic side effects. Continuous peripheral nerve blocks (cPNBs) provide targeted, prolonged analgesia with fewer systemic effects and facilitate bedside wound care. We report a case using median and radial cPNBs for hand burn management.



Figure 1: The patient had burn wounds confined primarily to the median and radial nerve distributions

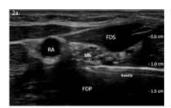




Figure 2a and 2b: Block needle advanced adjacent to the median nerve (2a) and radial nerve (2b).



Figure 3: Median and radial perineural catheters secured

Case Report: A 40-year-old male presented with 4% TBSA burns (face, neck, hands) after falling into a campfire. Severe pain from left hand burns precluded bedside debridement despite opioids. Regional anesthesia was consulted, and ultrasound-guided median and radial cPNBs were placed with 0.2% ropivacaine infusions (1 mL/hour continuous; 2 mL bolus, 30-minute lockout).

Pain improved from 10/10 to 3/10 at rest and 4/10 during wound care. The nerve blocks enabled daily debridements and facilitated active participation in physical and occupational therapy. Catheters were removed after Suprathel dressing placement, and the patient was discharged with oral analgesics. No complications were noted.

Discussion: This case highlights cPNBs' utility in burn pain management by providing targeted analgesia without systemic opioid side effects. Ultrasound-guided placement ensured precise blockade, reducing pain while preserving motor function. This enabled physical therapy, essential for preventing contractures and promoting recovery. Additionally, cPNBs allowed bedside wound care without general anesthesia, streamlining treatment. Regional anesthesia is a valuable tool in burn management, supporting both recovery and pain control.

References:

Holtman JR. Jellish WS. J Burn Care Res. 2012;33(6):692-701. Ilfeld BM. Anesth Analg. 2016;123(3):652-675.

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Town CJ et al. Clin J Pain. 2019;35(4):368-74. Perkins L et al. Reg Anesth Pain Med. 2024; In Press.

Learning points:

- · cPNBs provide site-specific analgesia with reduced systemic effects, facilitating non-operative burn care.
- · Median and radial nerve blocks effectively manage hand burn pain while preserving motor function.
- · Regional anesthesia expertise is vital for the successful implementation of cPNBs in burn management.

12AP10-10

A safe anesthetic alternative for intertrochanteric fractures in high risk patients: a case series

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Background: Intertrochanteric fractures (ITF) are common femoral fractures. Regional anesthesia (RA) is the preferred technique at our institution, however, certain comorbidities/drugs preclude a neuraxial approach (NA). We report two cases managed solely with peripheral nerve blockade (PNB).

Case Report: Case1: A 68-year-old female with a severely depressed ejection fraction and a drug-eluting stent on clopidogrel was proposed for urgent percutaneous ITF repair. Due to comorbidities, RA was considered most adequate, however, clopidogrel precluded a NA.

Ultrasound-guided suprainguinal fascia iliaca (US-SIFI) block was performed with 40mL 0.5% ropivacaine. Block quality was assessed and the patient was positioned for surgery.

Proximal surgical incision point revealed block insufficiency, which resolved with local anesthetic infiltration. The remainder of surgery was successful.

Case 2: A 50-year-old female with hydrocephalus was proposed for urgent ITF repair. Concerns about complications with NA motivated PNB. US-SIFI block (40mL 0.5% ropivacaine) was complemented with an iliohypogastric/ilioinguinal nerve block (10mL 0.5% ropivacaine), providing block sufficiency for the entire procedure.

Discussion: Anesthetic management of ITF is challenging as patients are often high risk. Certain comorbidities and the presence of anticoagulants may preclude NA. Although waiting for the elimination of these drugs can allow for the safe application of a neuraxial technique, treatment delay and its impact on mortality is well known. Hip innervation is complex, rendering PBN challenging. The SIFI block is attractive as it is capable of blocking the femoral, lateral femoral cutaneous (LFCN) and obturator nerves.

However, surgical incision is performed in a transition of dermatomes and the LFCN block can be insufficient as this territory may have subcostal/iliohypogastric nerve contributions, which may explain block insufficiency in case 1 and complete surgical anesthesia in case 2. To our knowledge, this is the first case that describes the combination of these two blocks for ITF repair.

References: BJA Educ. 2024 Jun;24(6):191-202.

Learning points: Balancing the need for timely surgical intervention with safe anesthetic practices remains a critical consideration in managing ITF patients. SIFI block complemented with ilioinguinal/iliohypogastric nerve block may be a safe management option, avoiding risks posed by neuraxial and general anesthesia.

12AP10-11

Analgesic efficacy of ultrasound-guided rectus sheath block in children undergoing midline abdominal hernia repair: A systematic review and meta-analysis

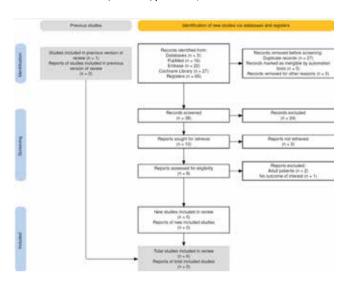
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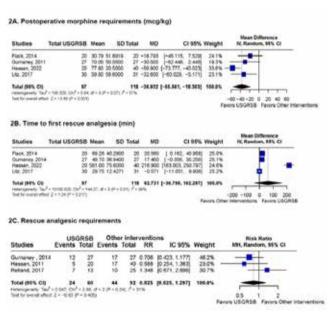
Background and Goal of Study: This systematic review and meta-analysis evaluated the analgesic efficacy of ultrasound-guided rectus abdominis sheath block (USGRSB) compared to other anesthetic methods in children undergoing midline abdominal hernia repair.

Materials and Methods: PubMed, Embase, and Cochrane databases were systematically searched. Randomized controlled trials (RCTs) reporting USGRSB for abdominal midline hernia repair were included. Primary outcomes were postoperative morphine equivalent consumption, time to first analgesia, and postoperative rescue analgesic requirements. Effect sizes were summarized as weighted mean differences (MD) for continuous outcomes and risk ratios (RR) for binary outcomes, with 95% confidence intervals (CI). Heterogeneity was assessed by the I² statistic. R was used for statistical analyses.

Results and Discussion: Of 65 studies, 6 RCTs were included, involving 305 patients (USGRSB n=137; control n=168). Main anesthetic techniques compared were wound infiltration, caudal epidural block, and intraoperative rectus sheath block by the surgeon. Patients had a mean age of 6.5 years, 48.5% were female,

and the weight was 24.4kg. USGRSB significantly reduced post-operative morphine equivalent consumption (MD=-36.93mcg/kg; 95% CI -55.56 to -18.30; I^2 =57%; p<0.001) and was associated with longer time to first rescue analgesia (MD=62.73min; 95% CI -36.80 to 162.26min; I^2 =98%; p=0.217). However, no significant difference was found in rescue analgesic requirements (RR=0.82; 95% CI 0.52 to 1.13; I^2 =31%; p=0.405).





Conclusion(s): In this meta-analysis, USGRSB was associated with significantly lower postoperative morphine equivalent consumption and time to tracheal extubation compared with other anesthetic techniques. Overall, these findings support the efficacy and safety of USGRSB for use in midline abdominal hernia repair in children.

Description of the effectiveness of BRILMA block in breast surgery

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Background: Advances in ultrasound and regional anaesthesia have led to important changes in breast surgery. Blocking the cutaneous branches of intercostal nerves in the mid-axillary line (BRILMA block) is an option that allows us to block the main innervation of the breast, including the areola-nipple complex, and even achieve analgesia of the axillary compartment (1).

Primary objective: to evaluate pain in patients undergoing breast surgery with or without BRILMA block according to the VAS score.

Secondary objective: to observe the effectiveness of the BRIL-MA block in breast surgery, studied with VAS score and opioids consume.

Materials and Methods: This is a single-center retrospective observational study. 212 patients who underwent breast surgery in 2023 in our center were analysed. We record the patients' characteristics and the surgery and the anaesthetic management from the pre-anaesthetic and operating room reports.

Acute pain during the first 48 hours was assessed by reviewing the nursing pain record according to the VAS score. T1:2h, T2:8h, T3:16h, T4:24h, T5:32h, T6:40h, T7:48h. Moreover we analyse the opioid consume in the postoperative period.

Results and Discussion: Of all the patients analysed, 25,7% underwent mastectomy and 74,3% underwent non-mastectomy breast surgery. BRILMA block was performed in 73,71% of these patients. In the group without BRILMA block, the averages VAS ptp score were: T1:1.51, T2:1.13, T3:0.32, T4:0.57, T5:0.11, T6:0.5, T7:0.36. In the group with BRILMA block, the averages VAS ptp score were: T1:1.66, T2:0.95, T3:0.51, T4:0.36, T5:0.83, T6:0.45, T7:0.50.

However, the comparison between the two groups was not statistically significant (p>0,05). In the subgroup of mastectomized patients, average postoperative methadone consumption was 3,08mg in no-BRILMA group and 2,5mg in BRILMA group, but comparing these results they were no statistically significant neither (p>0,05).

Conclusion: We found evidence that the group with BRILMA block has a lower VAS score and lower opioid use than the group without BRILMA block, although the results were not statistically significant.

References:

1. Diéguez P, Casas P, López S, Fajardo M. Ultrasound guided nerve block for breast surgery. Rev Esp Anestesiol Reanim. 2016 Mar;63(3):159-67.

12AP11-1

Transverse abdominis plane (TAP) block in extreme lateral interbody fusion (XLIF) surgery: a randomized feasibility trial

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Background and Goal of Study: Minimally invasive surgical techniques, such as eXtreme Lateral Interbody Fusion (XLIF), play a key role in enabling Enhanced recovery after surgery (ERAS) programs. Equally important are multimodal anaesthetic strategies with the potential to reduce the need for long-acting opioids. Regional anaesthesia, as part of the multimodal analgesia regimen, is especially important in this context. This study aims to investigate the impact of the Transversus Abdominis Plane (TAP) block on outcomes after XLIF surgery.

Materials and Methods: In this prospective, double blinded, monocentric, randomized controlled trial, the feasibility of a TAP block in elective XLIF surgery was evaluated in the Jessa Hospital, Hasselt, Belgium. Patients were randomized on a 1:1:1 ratio in to three groups: lateral TAP block, posterior TAP block and no block. The TAP intervention groups received an ultrasound-guided TAP block (lateral or posterior) in supine position with 40ml of bupivacaine 0.25%. The control group did not receive any locoregional technique. The received general anaesthesia was standardized. To asses feasibility outcome included TAP visualization and adverse events.

Results and Discussion: In total 30 patients were included in this pilot trial. TAP visualization was evaluated acceptable, good or very good (Table 1).

No significant intergroup differences were present. No block-related adverse events were registered (Table 2).

	Acceptable	Good	Very good	Poor	Very poor
Lateral TAP block	4 (40%)	1 (10%)	5 (50%)	0 (0%)	0 (0%)
Posterior TAP block	3 (30%)	5 (50%)	2 (20%)	0 (0%)	0 (0%)

Data are presented as frequencies (%).

Table 1: Identification rate of the correct TAP block by ultrasound as assessed by a five-point-scale (very good - good - acceptable - poor - very poor).

	Lateral TAP block	Posterior TAP block	p-value
Dizziness	0 (0%)	2 (20%)	0.47
Vomiting	0 (0%)	1 (10%)	0.31
Sweating	0 (0%)	1 (10%)	0.31

Data are presented as frequencies (%), A p-value of <0.05 is considered statistically significant.

Table 2: Side effects.

Conclusion(s): The results of this prospective, randomized pilot trial support the feasibility of a TAP block in patients undergoing XLIF surgery. Visualization of the TAP was adequate and no block-related adverse events occurred. Future research is needed to evaluate the effect of a TAP block on pain and recovery outcomes in patients undergoing XLIF surgery.

12AP11-2

Anesthetic management for open scapular fixation surgery in prone position in a polytraumatized patient with associated clavicle and multiple rib fractures: Double-lumen tube for one-lung ventilation to prevent recurring pneumothorax combined with erector spinae plane and brachial plexus blocks

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Background: Few literature reports regard the anesthetic management of scapular surgery and none in patients with previous pneumothorax despite the fact that it represents a challenge for the high risk of pulmonary and haemodynamic complications.

Case Report: 48 y.o. male, thoracic trauma after vehicle collision with the following right-side fractures: clavicle, 2nd to 6th ribs (displaced), scapula and brachial plexus avulsion (C5, C6 roots). Initially admitted to ICU due to hemopneumothorax requiring thoracic drainage, intubation and RBC transfusion; stable after the procedure, drainage withdrawn on D7. Scheduled for scapular surgery in prone position on day 14.

Regional anesthesia was performed first: ESP block at T3 level and interescalene block1 (both US-guided, ropivacaine 0,5%). Afterwards, induction and tracheal intubation with a 39Fr left-DLT. OLV was settled to check its plausibility, being well tolerated; and followed with two-lung ventilation during surgery. No respiratory complications arised. No further opioid requirements after intubation. Extubation was achieved in the operating room. In the first 24 hours, main VAS for pain was 0.



Discussion: The management of scapula fractures with previous pneumothorax in prone position requires careful consideration for the risk of recurrence due to manipulation above the underlying rib fractures. The placement of a double-lumen tube was decided for setting the patient in one-lung ventilation in case of signs of pneumothorax while the patient is in prone with an open surgery field, isolating the lung and avoiding a potential tension pneumothorax. Regional anesthesia techniques permitted an almost opioid-free procedure with no pulmonary complications in the postoperative course, allowing a safe weaning and extubation in the OR.

Reference:

1. Vinsard et al. Regional anesthesia for scapulothoracic fixation surgery: Anatomic review and case series. Clin Anat. 2023.

Learning points: Double-lumen tube for not-thoracic surgery to prevent severe pulmonary complications using OLV. Combined anesthesia (thoracic ESP and interescalene blocks) proves effective, allowing an opioid-free approach for open scapular surgery.

12AP11-3

Anaesthetic management of an achondroplastic patient undergoing humeral fixation: Challenges and insights

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Background: Achondroplasia, the most common skeletal dysplasia, affects 1 in 20,000-30,000 live births and presents unique challenges in anaesthetic management.

Case Report: A 44-year-old male, 130 cm tall and weighing 85 kg (BMI > 47), presented with a right supracondylar humeral fracture requiring ORIF with plate and screws. The patient had typical features of achondroplasia: short limbs, scoliosis, thoracic deformity, midface hypoplasia, and macroglossia, along with morbid obesity. He denied comorbidities or respiratory symptoms but reported discomfort in the supine position. Airway assessment revealed Mallampati grade III, limited cervical mobility, and normal mouth opening. Preoperative ECG and lab results were unremarkable. The plan involved a right brachial plexus block with sedation. Standard monitoring was applied, and a 20G IV cannula was placed under ultrasound guidance due to a thick adipose layer. A supraclavicular approach to the brachial plexus was chosen. Despite anatomical challenges, the block was performed using 20 ml of 0.5% ropivacaine and 1% lidocaine, achieving effective motor and sensory blockade.

During the procedure, the orthopaedic team requested a prone position, necessitating general anaesthesia. Preoxygenation was followed by induction with fentanyl, lidocaine, propofol, and suxamethonium. Intubation was performed with videolaryngoscopy, a bougie, and a size 7.5 endotracheal tube. Anaesthesia was maintained with sevoflurane and rocuronium. The 3-hour surgery proceeded uneventfully, with careful positioning and monitoring. The patient was extubated awake, recovering with an Aldrete 8.

Discussion: Patients with achondroplasia present challenges, including difficult airway management due to midface hypoplasia. macroglossia, and atlantoaxial instability. Macrocephaly and short limbs complicate positioning for regional blocks and surgery. Spinal abnormalities may hinder neuraxial anaesthesia, but regional blocks remain beneficial when carefully planned.

References:

- 1. Kim J, et al. Anesthetic Considerations in Patients With Achondroplasia. Cureus, 2021.
- 2. Oliveira CRD, et al. Anaesthesia and Uncommon Coexisting Diseases; Achondroplasia. Brazilian Society of Anaesthesiology, 2017.

Learning points: Regional anaesthesia is not contraindicated in achondroplasia and offers significant benefits. However, unique anatomical characteristics require meticulous planning and adaptation to ensure safe and effective anaesthetic management.

12AP11-5

Intermittent bolus vs. continuous infusion after paravertebral block for thoracic surgeries: a systematic review and meta-analysis

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Background and Goal of Study: Thoracic surgeries are associated with moderate to severe postoperative pain, which may lead to complications such as atelectasis or respiratory insufficiency. The paravertebral block (PVB) is an effective strategy for analgesia and can be performed with a postoperative infusion of local anaesthetics through a catheter. Nonetheless, there is still no consensus on which infusion method is superior: intermittent bolus or continuous infusion.

Therefore, we sought to compare both methods in terms of 24hour pain scores (visual analogue and numeric rating scales) and the need for rescue analgesia.

Materials and Methods: We systematically searched MEDLINE, Embase, and Cochrane for randomised controlled trials (RCTs) involving adult patients (>18 years old) undergoing thoracic surgery and comparing intermittent bolus vs. continuous infusion for postoperative analgesia with paravertebral catheters.

Standardised mean difference (SMD) and risk ratio with 95% confidence interval (CI) were computed under a random effects model. Statistical analyses were performed with Review Manager 5.4.

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	3.26	0.62	16.	2.25	0.77	- 26	17.1%	-0.001(0.54, 0.37)	
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Figure C. Starty or Salegous Calata 1998 Figure 2515 High 2018 Lts 2007 Yang 2012 Total 1998-CB	interno Event	others Bridge	15 40 18 30 34 135 0, eff - 4	Event		11. 40 16 27 20 137 1	23.0% 23.0% 5.4% 5.4%	8.44, Randows, 95%-CI 1.60 (6.68, 3.77) 3.63 (9.22, 1.76) 1.32 (9.15, 5.62) 8.25 (9.83, 2.40) 1.29 (6.46, 3.32)	Right Ratio Bild Kambus, 55% CI

Results and Discussion: Eight RCTs (n=386) were included in the final analysis. Video-assisted thoracoscopic surgery and thoracotomy were performed in six and two studies, respectively. Five studies performed PVB under ultrasound guidance.

One study used bupivacaine (0.25 - 0.375%), three studies used levobupivacaine (0.2 - 0.5%), and four studies used ropivacaine (0.2 - 0.75%)

There were no differences between both methods in 24-hour pain scores at rest (SMD -0.02, 95% CI -0.45 to 0.42, p=0.93, Figure A) and at movement (SMD 0.33, 95% CI -0.21 to 0.87, p=0.24, Figure B). Similarly, there was no difference in the need for rescue analgesics (RR 1.07, 95% CI 0.65 to 1.75, p=0.80, Figure C).

Conclusion(s): Intermittent bolus delivery and a continuous infusion for PVB in thoracic surgeries appear to be equally effective for postoperative analgesia. Nonetheless, the differences in volume and concentrations of local anaesthetic, frequency of bolus delivery, use of ultrasound, and minimally invasive vs. open surgery impaired a more granular assessment of the findings.

12AP11-6

Motor-sparing knee blocks vs adductor canal plus LIA for total knee replacements

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Background and Goals: Patients undergoing knee replacements (TKR) experience severe postoperative pain. Our institution has an established enhanced recovery programme with early mobilisation and daycase rate close to 50%. A short acting spinal anaesthetic, adductor canal block and large volume local infiltration (LIA) is the standard approach. Motor sparing nerve blocks of four geniculate nerves, nerves to rectus femors, vastus lateralis, intermedius and medialis, saphenous, popliteal plexus, and the anterior and lateral femoral cutaneous nerves have been used as an alternative to LIA. A maximum dose of 2-2.5 mg/kg bupivacaine was used in both techniques. We aimed to compare the analgesic quality between the two techniques.

Materials and Methods: Patients were classed into 2 groups.

Group 1 was a standard group of 30 consecutive patients undergoing primary TKR by one surgeon with the following criteria. Successful spinal anaesthesia, surgical LIA, adductor canal block, paracetamol and NSAID given, not on strong opioids preoperatively.

Group 2 was selected from a consecutive series receiving motor sparing blocks without LIA using same inclusion criteria. We retrospectively compared the post-operative opiate requirements between patients having either method.

All opiates doses were converted to intravenous morphine equivalents. Demographic data like age, sex, ASA status were collected. T test on MS excel was used to analyse the data.

Results and Discussion Demographic data showed similarity between both groups. 80% of LIA group required opiates in the first 6 hours versus 37% of the block group.

Average opioid requirement at 6hrs was 8.7mg in the LIA group Vs 3.2mg in the block group(p= 0.002). At 24hrs or discharge 87% of LIA group required opiates Vs 67% in the block group. Average opiate doses at this point were 18.4mg in LIA group Vs 10.7mg in the block group.(p=0.049). 33% of block group were opioid free at 24hrs compared to only 13% in the LIA group. Average length of stay for both groups was one day.

Conclusions: We demonstrated a significant difference in opioid requirements at 6 and 24 hrs when comparing motor sparing nerve blocks against LIA plus adductor canal block. 6 hrs post op is an ideal time to measure quality of analgesia as spinal has worn off and opioid requirements are a good measure of quality of analgesia.

References:

Motor-sparing nerve blocks for total knee replacement A scoping review Journal of Clinical Anesthesia Vol 68,Feb21,110076

12AP11-7

Addressing frailty and risk: Continuous spinal block in emergency abdominal surgery

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Background: Continuous spinal block (CSB) is an underused regional technique for abdominal surgery, allowing prolonged anaesthesia with precise titration of local anaesthetic, minimal hemodynamic and respiratory impact¹.

This case report highlights the use of CSB in emergent abdominal surgery in a frail and unstable patient.

Case Report: A 94-year-old male patient, ASA status IV, fully dependent (Barthel index 15), presented to the emergency department with abdominal pain and vomiting. The patient was hypotensive, with low peripheral oxygen saturations (92%), lactate 4.9 mmol/L and C-reactive protein level 132 mg/L. CT scan revealed an incarcerated right inguinal hernia with high suspicious of bowel ischemia and pneumonia.

After exposing the anaesthetic risks to the patient's family, informed consent was obtained. Under ASA standard monitoring, a paramedian CSB was performed at the L4-L5 interspace in right lateral position, using an 18G Tuohy needle. After confirming freeflow of cerebrospinal fluid, 3 cm of an epidural catheter was inserted and an initial 2.5 mg of hyperbaric bupivacaine plus 0.002 mg of sufentanil was administered. The patient was repositioned supine.

When a T8 sensitive level block was achieved, surgery proceed with a right inguinal incision. After 40 minutes, an additional 2.5 mg of bupivacaine was administered, to maintain patient comfort and allow bowel inspection. 10 mg of ephedrine was administered after each bolus of local anaesthetic. Analgesia was supplemented with paracetamol and wound infiltration with 15mL of ropivacaine 0,75%.

At the end of the procedure, the catheter was removed and the patient transferred to the post-anaesthesia care unit, remaining comfortable and stable. No post-dural puncture headache was reported.

Discussion: This case underpins CSB as a valuable technique to approach critical and frail patients with significant comorbidities, maintaining hemodynamic stability, safety and patient comfort².

References:

1. Hay, R., & Gupta, A. (2022). Continuous spinal anaesthesia. *BJA Education*, 22(8), 295-297. 2. Spannella, F. et al. (2020). Thoracic continuous spinal anaesthesia for high-risk comorbid older patients undergoing major abdominal surgery: one-year experience of an Italian geriatric hospital. Minerva Anestesiology, 86(3), 261–269.

Learning points: CSB minimizes side effects and provides clinical efficacy, offering a tailored solution for patients unsuited for general, single-shot spinal, or epidural anaesthesia.

12AP11-9

Comparison of the anesthetic effects of dexmedetomidine and dexamethasone as adjuvants added to infraclavicular brachial plexus block under ultrasound guidance in upper extremity surgery

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Background and Goal of Study: This study aimed to investigate the effects of dexmedetomidine and dexamethasone as adjuvants during ultrasound-guided infraclavicular block in patients undergoing upper extremity surgery.

Materials and Methods: This prospective observational study included 44 patients undergoing upper extremity surgery. The patients were divided into two groups: Group A (Dexmedetomidine, n=22) and Group B (Dexamethasone, n=22).

The duration of hospital stay, sensory and motor block onset times, total block duration, time to first postoperative analgesic requirement, total postoperative analgesic consumption within 24 hours, adverse events, hemodynamic parameters, Ramsay Sedation Scale (RSS) scores, and Visual Analog Scale (VAS) scores were recorded.

Results and Discussion: There was no significant difference in demographic data between the groups. The duration of hospitalization was significantly shorter in Group A (p<0.001). The sensory and motor block onset times were significantly shorter in Group A (p<0.001). However, the sensory and motor block durations were also significantly shorter in Group A (p=0.003 and p=0.023, respectively). Cumulative time analgesia (CTA) was significantly lower in Group A at T3 (p=0.009) and T4 (p=0.021) measurements. RSS scores were significantly higher in Group A at T1 (p=0.019) and at T2, T3, and T4 (p=0.009). The first postoperative analgesic requirement occurred earlier in Group A (p<0.001). Analgesics were required in all patients (100%) in Group A, while only 5 patients (22.7%) in Group B required analgesics (p<0.001). VAS pain scores were significantly higher in Group A at T3 (p=0.015) and T4 (p<0.001).No cases of nausea, vomiting, hypotension, or nerve damage were observed in either group. Bradycardia was reported in 5 patients (22.7%) in Group A and 1 patient (4.5%) in Group B. Conclusion: In the dexmedetomidine group, the need for postop-

Conclusion: In the dexmedetomidine group, the need for postoperative analgesia occurred earlier, and the total amount of analgesic consumption was higher due to the shorter block initiation and total block duration.

On the other hand, the sedation observed in the dexmedetomidine group could be considered an advantage, potentially enhancing intraoperative comfort. No significant adverse events requiring intervention were observed with either adjuvant.

Further comprehensive studies are necessary to establish optimal adjuvant selection and dose standardization strategies for peripheral nerve blocks or alternative regional block techniques.

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12AP11-10

The role of the quadratus lumborum block in multimodal pain management following inguinal hernia surgery

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Background and Goal of Study: The use of ultrasound in anesthesiology has enabled truncal blocks as part of multimodal analgesia. Studies show that ultrasound-guided quadratus lumborum block (QLB) reduces pain for over 24 hours and lowers opioid use when combined with Paracetamol, NSAIDs, and other analgesics. This study assesses the efficacy of QLB following inguinal hernia repair.

Materials and Methods: This study enrolled 40 patients undergoing unilateral inguinal hernia repair. The eligibility criteria were ASA physical status I, II, or III and no chronic pain conditions. In 20 patients, the block was performed before surgery, and non-opioid analgesics were regularly prescribed in the first 24 hours postsurgery (QLB group).

In the control group (20 patients), only non-opioid analgesics were prescribed without nerve block. The block was performed preoperatively using an ultrasound-guided single-shot technique, in-plane.

The outcomes assessed included postoperative pain at 1h, 6h, 12h, 24h, motion pain at 12h and 24h, and opioid consumption. We also evaluated intraoperative fentanyl consumption.

Results and Discussion: Postoperative pain scores were evaluated at 1h, 6h, 12h, and 24 hours after surgery, as well as motion pain at 12h and 24h. Pain scores in the QLB group were significantly lower than in the control group. In the QLB group, there was no need for opioid analgesics, while in the control group, 7 patients (35%) received opioid analgesics.

Opioid consumption during general anesthesia was significantly lower in the QLB group compared to the control group. The fentanyl dose in the QLB group (3.06 mcg/kg ±0.91) was significantly lower than in the control group (4.18 mcg/kg ±1.00).

Conclusion(s): Our results indicate that the guadratus lumborum block, as part of multimodal analgesia, provides adequate postoperative analgesia for adult patients undergoing inguinal hernia repair surgery.

12AP11-11

Adductor canal block versus femoral nerve block in total knee arthroplasty: Network meta-analysis

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Background and Goal of Study: Postoperative rehabilitation is crucial for preventing complications, with regional anesthesia (RA) playing a key role, especially in orthopedic surgery. Total knee arthroplasty (TKA) traditionally used continuous femoral nerve block (CFNB) as the gold standard for pain management, but recent PROSPECT Society guidelines now recommend the single-shot adductor canal block (SACB). Its advantage lies in the absence of motor block, though evidence on its analgesic effectiveness is limited. This study aims to compare adductor canal and femoral nerve blocks in elective primary TKA.

Materials and Methods: A systematic review and network meta-analysis were conducted in accordance with PRISMA-NMA guidelines. Studies published between 2013 and June 2023 were identified through Medline, PubMed, Google Scholar, and Cochrane CENTRAL. The search included randomized and non-randomized studies comparing adductor canal blocks and femoral nerve blocks in TKA. Data extraction was performed by three independent reviewers, with opioid consumption converted to oral morphine equivalents. A frequentist random-effects network meta-analysis was conducted using CINeMA and STATA 17. Risk of bias was evaluated using the RoB2 and ROBINS-I tools, while the certainty of evidence was assessed through the GRADE methodology integrated within the CINeMA framework.

Results and Discussion: Thirty-six studies with 3,308 patients were included. CFNB provided superior pain relief compared to SACB at both 24 and 48 hours (MD 0.55-0.71), though SACB was associated with higher opioid use (MD 7.35). SACB, however, led to faster functional recovery at 24 hours (MD -22.11), but this benefit was no longer seen at 48 hours. Continuous adductor canal block (CACB) emerged as the most effective, offering better functional recovery and shorter hospital stays compared to CFNB, despite slightly higher opioid consumption. The certainty of evidence varied from low to moderate.

Conclusion(s): The analysis suggests that changing the gold standard to SACB for pain management after total knee arthroplasty may be premature. While SACB improves mobility, it provides insufficient analgesia compared to CFNB. CACB stands out, offering both effective pain relief and a shorter hospital stay. Further research is warranted.

12AP11-12

Placement of an epidural catheter near the drain in cardiac surgery patients during MIDCAB surgery

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Background and Goal of Study: In minimally invasive cardiac and thoracic surgery, there is still a problem of postoperative pain relief. The best method of pain relief for these patients is the introduction of anesthetic into the drainage.

However, this affects depressurization and infectious complications. An epidural catheter inserted near the pleural drainage can relieve these problems.

Materials and Methods: 45 Patients undergoing MIDCAB and thoracoscopic surgery using catheter placed near the pleural drain and, as a comparison group, 45 patients who underwent paravertebral anesthesia were studied. The pain level was assessed using a visual analogue scale.

The general principle of pain relief was as follows. For paravertebral anesthesia, 20 ml of 0.25% ropivacaine solution was used three times a day. When installing an epidural catheter near the pleural drainage, 20 ml of 0.25% ropivacaine solution was also used three times a day.

During rehabilitation, 35 of the 45 patients in the paravertebral anesthesia group received morphine or trimeperidine. In the group of patients with a catheter near the chest drain, none received an opioid.

Results and Discussion: In the paravertebral anesthesia group, the level of the visual analogue scale postoperatively was from 3 to 5 in 35 patients out of 45. In the group with the installation of an epidural catheter next to the pleural drainage, the visual analogue scale did not rise above 2 points in all 45 patients.

Conclusion(s): Inserting a catheter next to the pleural drainage is the most comfortable and simple method of pain relief after MIDCAB and thoracoscopic operations and eliminates possible problems with drainage depressurization and infectious complications.

12AP12-3

Accidental intrathecal morphine overdose - do not forget it

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Background: Epidural catheters are routinely used, and anaesthesiologists must identify an off-site catheter and manage its complications.

Case report: An 81-year-old woman with arterial hypertension and class I obesity was transferred to the post-anaesthesia recovery unit (PACU) after total knee arthroplasty under spinal anaesthesia as part of a combined spinal-epidural technique that required multiple attempts.

After (<5 minutes) a negative epidural test dose, 2 mg of morphine were administered. Minutes later, the patient reported motor blockade of the lower limbs. Clear fluid was freely aspirated from the catheter, which was removed.

The patient remained under overnight surveillance.

In the morning (14 hours after the accidental administration), the patient had altered consciousness and was hypoventilating without improving after naloxone boluses. Arterial blood gas values were: pH 7.1, paO, 67.1mmHg, paCO, 88.2mmHg, HCO, 28mmol/L, lactate 5.6 mmol/L. Bilevel-positive air pressure ventilation and a continuous naloxone infusion were initiated.

The patient improved after 2.5 hours of noninvasive ventilation and 10 hours of naloxone infusion (0.24-0.04mg.h-1).

Twenty-eight hours after the accidental intrathecal administration the acidemia had resolved.

The patient remained stable over the next 12 hours and was transferred to the ward.

Discussion: The catheter could be intrathecal due to unrecognised initial misplacement or later migration. Factors that could have contributed to failed timely detection were neglected aspiration, the catheter partially in the intrathecal space, inadequate testing for motor blockade, insufficient waiting time after the test dose and delayed patient report.

After recognition of intrathecal morphine overdose, the side effects were treated as they developed. However, a naloxone infusion started before the patient becomes symptomatic and closely after morphine injection can control side effects without the need for ventilatory support1.

References:

1. Cannesson, M, Nargues, N, Bryssine, B, Debon, R, Boselli, E, & Chas sard,D(2002)Intrathecalmorphineoverdoseduringcombinedspin al-epiduralblockforCaesareandelivery.BJA89(6)925-927

Learning points: Test dose in combination with aspiration should always be used to check the correct placement of an epidural catheter.

After an intrathecal morphine overdose, patients should be managed in a specialised unit with the possibility of early initiation of naloxone infusion and, if necessary, ventilatory support.

Regional Anaesthesia

12AP12-4

Stellate ganglion blockade for the treatment of refractory atrial fibrillation

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Background: Stellate ganglion blockade (SGB) has been described as an effective adjunct treatment for refractory ventricular tachyarrhythmias.¹

However, there is no evidence of its use in the management of refractory atrial fibrillation (AF).

Case Report: AA 60-year-old male with unknown medical history, presented to the emergency department with a thyroid storm, causing rapid AF and decompensated dilated cardiomyopathy, resulting in cardiogenic shock.

The initial approach was made by the cardiology team: tracheal intubation, sedation, vasopressors and treatment of thyroid storm. Due to unstable tachyarrhythmia, patient underwent 1 trial of single electrical cardioversion followed by 3 trials of dual synchronized electrical cardioversion without reverting to neither sinus rhythm nor rate control. Considering the clinical circumstances and the high risk of pharmacological cardioversion, the anesthesiology team was called for SGB.

Initially, the team performed an ultrasound-guided unilateral left SGB with 10mL ropivacaine 0,2%, that went uneventfully.

After 10 minutes, there was no rate nor rhythm control, and an US-guided right-sided SGB with 10mL ropivacaine 0,2% was perfored for bilateral blockade, as the patient had already been intubated.

After 15 minutes, there was a small decrease in the heart rate (170 bpm to 150bpm), although the patient remained in rapid atrial fibrillation, there was no increase in the vasopressors needs after the technique. Patient had, however, an unfavorable evolution and died 18 days post-admission.

Discussion: SGB has been suggested to suppress sympathetic activity and downregulation of beta1-adrenergic receptors. The vagal stimulation and nitric oxide release may contribute to its effects on atrial tachyarrhythmias.

Although this technique had no efficacy in this patient, the SGB was a viable option as the atrial fibrillation was probably highly sympathetic-dependent due to the thyroid storm.

References:

1. Tian, Y., Wittwer, E. D., Kapa, S., McLeod, C. J., Xiao, et all (2019). Effective Use of Percutaneous Stellate Ganglion Blockade in Patients with Electrical Storm. *Circulation: Arrhythmia and Electrophysiology*, *12*(9). https://doi.org/10.1161/CIRCEP.118.007118

Learning points: There is need for further investigation, if, in selected cases, SGB can be usefull in the management of refractory AF with rapid ventricular response.

12AP12-6

Efficacy and safety of PENG block for shoulder surgery: a case series

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Background: Multimodal analgesic treatment is a fundamental component of perioperative care for patients undergoing shoulder surgery. Pericapsular Nerve Group (PENG) block for shoulder surgery is an innovative regional anesthesia technique specifically designed to provide targeted analgesia to the glenohumeral joint.

This technique involves placing the linear ultrasound transducer between coracoid process and humeral head, identifying humeral head, subscapular muscle, and deltoid muscle. Using an in-plane approach, local anesthetic is injected between deltoid and subscapular muscles.

Case Report: Report of four cases of adult patients undergoing shoulder surgery (shoulder arthroplasty / arthroscopy). The anesthetic strategy was shoulder PENG block under ultrasound guidance, followed by general anesthesia.

The efficacy of the block was assessed using the visual numeric scale (VNS) of pain during the stay in the post-anesthesia care unit (PACU) and the first 12 postoperative hours.

The safety of the block was assessed by evaluating the motor block of the upper extremity and the occurrence of associated nerve, vascular or respiratory complications.

Discussion: Shoulder PENG block associated with acetaminophen, NSAIDs and tramadol provided optimal postoperative pain control (VNS < 3) during the stay in PACU and first 12 postoperative hours in four patients (90%). One patient required a rescue dose of morphine. No patients evaluated presented motor block of upper extremity or associated nerve, vascular or respiratory complications.

According to anatomical studies, local anesthetic spreads through glenohumeral capsule surrounding humeral head, with potential extension toward axillary region. However, further clinical studies are necessary to determine its efficacy, anesthetic volume, and surgical applicability

References:

- 1. Altinpulluk, E. Y., et al. (2020). Pericapsular nerve group block for postoperative shoulder pain: A cadaveric radiological evaluation. *Journal of Clinical Anesthesia*, 67, 110058.
- 2. Küpeli, İ., et al. (2022). Anesthesia or analgesia? New block for shoulder surgery: Pericapsular nerve group block. *Brazilian Journal of Anesthesiology*, 72(5), 669-672.

Learning points: Compared to the interscalene block, shoulder PENG block avoids motor block and pulmonary complications, making it an optimal alternative for patients at risk of respiratory complications, such as severe respiratory diseases, obesity or contralateral recurrent paralysis.

12AP12-7

Analgesia for 'positioning pain' in hip fracture patients receiving spinal anaesthesia

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Background and Goal of Study: Positioning pain refers to patient discomfort experienced during positioning for a procedure. Hip fracture patients receiving spinal anaesthesia were identified as a target for quality improvement in this regard in our institution. PubMed and EMBASE were searched up to March 2024.

Two observations were made – higher level evidence was sparse and regional analgesia strategies at odds with intravenous techniques. Local expert opinion was sought to culturally contextualise this in our setting.

Materials and Methods: A 7-item questionnaire was synthesised de novo according to best practice guidance1 and examined for face validity before circulation within a tertiary acute general and teaching hospital. No piloting was conducted in view of anticipated small sample size and low response rate.

Results and Discussion: The questionnaire was extended to 130 anaesthesiologists of mixed grade, with 25 responses obtained. 96% (n=24) indicated either fentanyl, ketamine or both as viable analgesia; midazolam (48%, n=12) or propofol (48%, n=12) were predominantly suggested for sedation.

Regional analgesia was deemed unnecessary by 36% (n=9); the remainder indicated a preference for fascia iliaca compartment block (32%, n=8), femoral nerve block (28%, n=7) or either of these (4%, n=1) with implementation limited however by time pressure (48%) more than technical ability (44%).

No respondent indicated pericapsular nerve group (PENG) blocks despite these being suggested as superior in this context². Greater clinician experience was correlated via Spearman statistical analysis with less frequent nerve block consideration (rs = -0.46, p = 0.02).

Conclusion(s): Intravenous analgosedation is predominant but its approach heterogeneous, while regional analgesia and its challenges merit exploration.

Local expert opinion requires amalgamation with existing evidence-based medicine, but promoting regional strategies may require stakeholder analysis, discussion of patient workflow, and provider education initiatives.

References:

1. Gehlbach H, & Artino AR (2018). The survey Checklist (Manifesto). Academic Medicine, 93(3), 360-366. 2. Jeevendiran A et al (2024). Comparative evaluation of analgesic efficacy of Ultrasound-Guided pericapsular nerve group block and femoral nerve block during positioning of patients with hip fractures for spinal anesthesia: a Prospective, Double-Blind, Randomized controlled study. Cureus. 2024 Mar 16;16(3):e56270.

12AP12-8

Horner's syndrome following infraclavicular brachial plexus block: a rare postoperative complication

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Background: We present a rare complication of brachial plexus block during postoperative analgesia: Horner's syndrome. This condition developed after an infraclavicular brachial plexus analgesic block was performed for surgical treatment of a human

This case is noteworthy due to the unusual presentation of Horner's syndrome, its successful management, and its implications for safe regional anesthesia practices.

Case Report: A 50-year-old male, with no significant medical history, underwent left hand debridement of infected soft tissues and bone. The procedure was conducted under balanced general anesthesia with placement of a left infraclavicular brachial plexus perineural catether for continuous postoperative analgesia. Pacient Control Regional Analgesia (PCRA) protocol was instituted with ropivacaine 0.2% (5.2 mL/h basal rate, 5 mL bolus, 240 min lockout).

On the second postoperative day, by the time of Acute Pain Unit observation, the patient presented with paresthesia, ptosis and miosis, leading to a suspicion of Horner's syndrome. The infusion was stopped, and analgesia was managed with manual boluses of ropivacaine 0.1%. Symptoms resolved.

Discussion: Horner's syndrome is a rare complication of infraclavicular blocks, primarily due to the unintentional spread of local anesthetic to the stellate ganglion or sympathetic chain.

While the literature primarily associates Horner's syndrome with brachial plexus interscalene and supraclavicular blocks, reports of this condition following infractavicular blocks are rare (1)(2). Early recognition and management of these complications are crucial to avoid patient anxiety and ensure recovery.

The complete resolution of symptoms in this case underscores the importance of monitoring patients and also the reversible nature of Horner's syndrome when promptly addressed.

Reference:

1. Jandard C, Gentili ME, Girard F, et al. Infraclavicular block with lateral approach and nerve stimulation: extent of anesthesia and adverse effects. Regional Anesthesia and Pain Medicine. 2002;27(1):37-42. 2) Kilka HG, Geiger P, Mehrkens HH. Infraclavicular vertical brachial plexus blockade. A new technique of regional anaesthesia. Anaesthesist. 1995;44(5):339-344.

Learning points: Horner's syndrome can occur as a rare complication of infraclavicular brachial plexus blocks due to unintended local anesthetic spread.

Vigilant monitoring and prompt management are essential to address regional anesthesia complications.

12AP12-9

Double epidural catheter anesthesia in a super-obese patient – a case report

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Background: The anesthetic management of obese critical patients is often challenging. Patients with BMI above 50 are classified as super obese by World Health Organization (WHO). Airway management and respiratory function are common anesthetic concerns, hence neuraxial anesthesia has invaluable benefits to minimize perioperative complications.1

Case Report: We report the successful management of a super obese woman (BMI 64) with extensive necrotizing fasciitis and respiratory distress. A 54-year-old woman (160 Kg, 158 cm) reported to the emergency department a week after falling with right-sided impact on her trunk. She had hypertension and sleep apnea with nocturnal CPAP therapy.

Truncal skin inflammation and increased respiratory rate were evident, with hypoxemia on room air. CT scan showed an extensive subcutaneous hematoma extending from her axilla to the inguinal crease.

CPAP was instituted in ICU and 2 epidural catheters were inserted (T5-T6 and L2-L3) for analgesia. 10 ml of 0,5% Ropivacaine were used in each catheter to cover the extension of the hematoma. Surgical debridement with large truncal incisions was successfully accomplished. The patient reported no complains during the procedure, with respiratory and hemodynamic stability.

Discussion: There are no clinical reports on the use of two epidural catheters for extensive truncal anesthesia of super obese patients. Epidural catheter placement is often difficult due to positioning and increased distance from the skin to the epidural space.1

While infection is a relative contraindication for neuraxial anesthesia, there is a low incidence of infection (0.007%-0.6%) of the central nervous system after neuraxial punctures in patients at risk or with bacteremia2.

The use of two epidural catheters can extend anesthetic coverage, avoiding general anesthesia.3

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Learning points:

Epidural anesthesia for surgical super obese patients is an invaluable alternative when trying to avoid major airway management and respiratory complications.

12AP12-10

The effect of pectointercostal fascia plane block applied in addition to serratus anterior plane block on postoperative analgesia in breast reduction surgery

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Background and Goal of Study: We aimed to investigate the effect of applying another plane block, Pectointercostal fascia plane block (PIFB), in addition to Serratus anterior plane block (SAPB) before bilateral breast reduction surgery on postoperative morphine consumption and pain scores (rest + movement).

	Group I (n=30)	Group II (n=30)	P values
VAS (Rest) 15.min	3.4±1.2 2.6±1.2	4.7±2.2 3.9±2.0	0.009 0.002
2th hours 6th hours 12th hours 24th hours	2.1±1.3 1.8±1.1 1.2±0.9	3.5±2.0 3.4±1.7 2.7±1.4	0.003 0.00 0.00
VAS (Movement) 15.min 2th hours 6th hours 12th hours 24th hours	4.4±1.5 3.6±1.0 3.3±1.4 2.8±1.2 2.1±1.3	5.8±2.1 5.2±1.9 4.9±1.8 4.6±1.6 3.7±1.6	0.003 0.00 0.001 0.00 0.00

	Group I (n-50)	Group II (n-30)	Pvalues
Nauva	9	8	0.783
Nansca (vomiting	141	6	
Stay in PACU time (min)	38.8±25.6	32.7±8.1	0.806
Morphine consumption in			
24th hours(mg)	3.7±2.2	7.9±2.3	0.00
Median	4.0	8.0	
Min.max	0.0-8.0	3.0-12.0	
Morphine demand for PCA in			
24th hours	4.5±2.7	10.4±3.7	0.00
Median	[4.0	10.0	
Min Max	0.0-10.0	4.0-20.0	
Rescue analgesic requirement			
(+).	20 (66.7%)	28 (93.3%)	0.01
(6)	10 (33.3%)	2 (6.7%)	

Materials and Methods: 64 patients aged 18 years and older, ASA I-II, were included in the study and divided into two groups. General anesthesia was induced with 2 mg/kg propofol, 0.6 mg/ kg rocuronium and 2 µg/kg fentanyl in all patients and maintained with sevoflurane 1-2%, 40/6002/air, remifentanil infusion.

After intubation, patients in Group I received PIFB (bilateral 15 ml 0.25% bupivacaine) in addition to SAPB (bilateral 20 ml 0.25% bupivacaine). Patients in Group II received only SAPB (bilateral 20 ml 0.25% bupivacaine).

All patients received postoperative patient-controlled analgesia with IV morphine (1mg bolus, 10 min lockout, 4-hour limit of 10 mg). Intraoperative hemodynamic data, sevoflurane and remifentanil consumption, surgery duration, extubation duration, and duration of stay in the postanesthetic care unit (PACU) were recorded. Morphine consumption in the first 24 hours postoperatively, number of morphine rdemands, visual pain scores (VAS) at rest and movement, additional analgesic requirement, sensory blockade monitoring, and complications were recorded.

Results and Discussion: The groups were similar in terms of demographic data, duration of surgery, extubation time, duration of stay in PACU. Postoperative 24-hour morphine consumption was 3.7±2.2mg in patients in Group I and 7.9±2.3mg in patients in Group II (p<0.05). When we look at the number of postoperative morphine demands, it was 4.5±2.7 in Group I and 10.4±3.7 in Group II (p<0.05). VAS scores at both rest and movement in the first 24 hours postoperatively were higher in Group II than in Group I (p<0.05). There was no difference between the groups in terms of additional analgesic requests (p>0.05). No complications were observed.(Table1,figure1)

Conclusion(s):It was concluded that addition of PIFB to SAPB applied preoperatively in breast reduction surgery reduced morphine consumption and pain scores in the first 24 hours postoperatively compared to SAPB alone without causing any complications.

12AP12-11

Anaesthesia mumps after epidural anaesthesia for caesarean section in a patient with long QT syndrome: A rare case report

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Background: Anaesthesia mumps (AM) is a rare transient post-operative sialadenitis encountered most commonly after general anaesthesia. Long QT syndrome (LQTS) is defined as QTc \geq 480ms or QTc \geq 460ms in symptomatic individuals.

We report the case of a woman with LQTS, who received epidural anaesthesia (EPD) for caesarean section and developed AM.

Case Report: A primiparous 42-yo woman was referred to our hospital at 39 weeks of gestation for elective caesarean section. She had a past history of anorexia nervosa with a hospital admission due to hypokalaemia (K^+ 1.9).

Preoperative lab results and ECG revealed a K^+ value of 3,1 and a long QTc of 460ms. Cardiology consult was requested and the K^+ was corrected to 3,7. The preoperative evaluation was otherwise normal. EPD was selected as the most haemodynamically stable technique. The catheter was placed at the L3-L4 level under sterile conditions.

Intraoperatively, lidocaine 2% 2ml, ropivacaine 0,75% 9ml and fentanyl 50mcg were given EPD. After delivery, intravenous cefoxitin 2gr, midazolam 1mg and carbetocin 100mcg were given, as well as morphine 2mg EPD for postoperative analgesia, without adverse reactions.

The patient remained haemodynamically stable; vital signs \pm 25% from the baseline. Within 10 minutes after exiting the operating room, she complained of a painless bilateral parotid swelling, that was hard on palpation with no signs of crepitus. She received hydrocortisone 200mg and ENT consult was requested. Ultrasound of the structures supported the clinical diagnosis of AM and watchful waiting was proposed. The swelling resolved spontaneously on the 4^{th} postoperative day with no complications.

Discussion: The proposed pathophysiological mechanisms of AM include the use of muscle relaxants and vasopressors, as well as surgical position, intratracheal manipulation and preoperative dehydration. AM following EPD is extremely rare, with only 3 other cases reported to our knowledge¹.

In this case the use of the aforementioned drugs was avoided, due to concerns of exacerbating the LQTS, leaving increased viscosity of the saliva due to dehydration as the only probable explanation of the phenomenon.

References:

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Learning points: Pathophysiological mechanism of AM.

AM is a benign phenomenon that can be encountered even after

12AP12-12

Thoracic epidural anesthesia is considered to be the gold standard for regional anesthesia in thoracic surgery. But is this method always effective?

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Background and Goal of Study: The effectiveness of thoracic epidural anesthesia (TEA) for pain management of thoracic surgery has been proved and now it is among the recommendations. However, the method is technically difficult, has limitations in use and when used is not always effective. The National Cancer Institute is a leading national centre for surgical treatment of lung, mediastinal and chest wall tumors in Ukraine. More than 500 surgeries are performed annually.

The aim of this study was to assess the proportion of operations covered by regional methods, including TEA, and to determine the problems anesthesiologists faced when using TEA in thoracic surgery.

Materials and Methods: We analyzed the use or the attempts of use of TEA in 429 thoracic surgeries over a 10-month period. We calculated the percentage of successful catheter placement attempts, the percentage of effective TEA (the criterion for effectiveness was the need for morphine of less than 10 mg/day in the postoperative period), the dependence of the success and effectiveness of attempts on the experience of the anesthesiologist performing the manipulation. We estimated the percentage of complications of TEA.

Results and Discussion: Out of 429 thoracic surgeries, 297 (69.2%) were covered by regional (TEA, TPVB, ESP) methods of analgesia, including 52.2% covered with TEA. 204 TEA attempts were performed during 10-month period , 43 (21%) attempts failed.

The effectiveness of TEA was insufficient in some patients (17.4%) who underwent it. The proportion of successful TEA correlated with the experience of the anesthesiologist performing the manipulation (Table).

The incidence of complications of TEA was not significant (6.4%) and the complications themselves (vascular puncture, subarachnoid space puncture, hypotension, bradycardia, nausea) were not life-threatening.

Experience of the anesthesiologist	Attempts	Failed attempts	Attempts resulted in successful catheter placement	Ineffective TEA
Anesthesiologists with the experience > 10 years	86	8 9.3%	78	15 19.2%
Anesthesiologists with the experience 5-10 years	40	7 17.5%	33	5 15.2%
Residents	78	28 35.9%	50	8 16 %

Table. Correlation between the success and the effectiveness of attempts and the experience of the anesthesiologist performing the manipulation

Conclusion(s): TEA is a technically challenging method of regional anesthesia, the use of which does not always lead to success. The effectiveness of TEA in thoracic surgery also depends significantly on the experience of the anesthesiologist.

12AP13-1

Application of bilateral recto-intercostal fascial plane block as rescue analgesia after laparoscopic cholecystectomy: a case report

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Background: For postoperative pain control in laparoscopic cholecystectomies, various fascial plane blocks such as the Transversus Abdominis Plane Block (TAPB), Erector Spinae Plane Block (ESPB), Modified Pericostal Approach to Thoracoabdominal Nerve(M-TAPA) Block, and External Oblique Intercostal Block(EOIB) are performed in combination with intravenous (IV) analgesics.

Recently, Tulgar et al. described a new interfascial plane block technique called the "Recto-Intercostal Fascial Plane Block" (RIFPB). RIFPB is performed between the rectus abdominis muscle and the sixth and seventh costal cartilages just inferior lateral to the xiphoid. RIFPB targets the anterior and lateral cutaneous branches of the T6-T9 thoracoabdominal nerves.

This case report, consisting of two cases, aims to share the analgesic effects of RIFPB when applied as rescue analgesia in patients whose pain could not be controlled with IV analgesics following laparoscopic cholecystectomy.

Case Report: Informed consent was obtained, and standard ASA monitoring was performed for laparoscopic cholecystectomy surgery on a 51-year-old female patient with ASA II due to smoking and a 49-year-old female patient with ASA II due to hypertension. Anesthesia induction was performed with 1 mcg/kg fentanyl IV 1 mg/kg lidocaine IV and 2 mg/kg propofol IV.

Maintenance anesthesia included sevoflurane inhalation and remifentanil infusion. For postoperative analgesia,100 mg tramadol hydrochloride IV and 50 mg dexketoprofen tromethamin IV were administered.

Additionally,3 mg granisetron IV was given for postoperative nausea and vomiting. Following extubation, both patients reported severe pain during follow-up in the recovery room at the 5th and 15th minutes (visual analog scale [VAS] scores of 9 and 8, respectively). Bilateral RIFPB Block under ultrasound guidance was planned as rescue analgesia.

After sterilization, 20 ml of local anesthetic solution (10 ml 0.5% bupivacaine + 10 ml normal saline) was administered bilaterally using a peripheral block needle (80 mm, Vygon) under ultrasound guidance. Ten minutes after the block, the patients' VAS scores decreased to 5. At 20 minutes. VAS scores were recorded as 3. Both patients, with stable vital signs, were transferred to the ward.

Discussion: We believe that the newly defined RIFPB can be considered a viable option for postoperative analgesia management in patients undergoing laparoscopic cholecystectomy, as it effectively blocks peripheral nerves between T6 and T9.

12AP13-2

Ultrasound guidance vs. conventional techniques for spinal anesthesia in obese parturients: a comparative study

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Background and Goal of Study: Spinal anesthesia in obese parturients poses significant challenges due to difficulty in identifying anatomical landmarks and achieving optimal positioning. Ultrasound-guided spinal anesthesia has emerged as a potential alternative to traditional landmark-based techniques, offering improved visualization and accuracy.

This study aimed to compare the efficacy, safety, and patient satisfaction of ultrasound-guided spinal anesthesia with conventional techniques in obese parturients undergoing cesarean

Materials and Methods: A prospective, comparative study was conducted over one year, including 120 obese parturients scheduled for cesarean sections. Participants were divided into two groups: Group A (n=60), receiving ultrasound-guided spinal anesthesia, and Group B (n=60), using conventional landmark-based

The primary outcomes included the number of puncture attempts, success rates of anesthesia, post-anesthetic complications, and maternal satisfaction. Postoperative pain was evaluated using the Visual Analog Scale (VAS), and results were statistically compared between the two groups.

Results and Discussion: The gestational age was similar between groups (37.7 \pm 2.53 weeks in Group A vs. 39.5 \pm 2.14 weeks in Group B, p=0.07). Ultrasound guidance significantly reduced the number of puncture attempts, with 100% of patients in Group A requiring 1-2 attempts, compared to only 66.6% in Group B, where more than five attempts were often needed.

The failure rate was also lower in Group A (6 cases) than in Group B (15 cases). Post-dural puncture headache (PDPH) incidence and severity were similar across groups. Sensory block levels (T6 or higher), block onset times, and durations were comparable between groups.

Postoperative pain scores were equivalent at rest and during mobilization, but maternal satisfaction was significantly higher in Group A, with 53 patients reporting being "very satisfied" versus 41 in Group B.

Most studies support ultrasound's role in improving anesthetic outcomes by enhancing visibility of anatomical structures . This results in fewer attempts, reduced procedure time, and higher patient satisfaction.

Conclusion(s): Ultrasound-guided spinal anesthesia offers significant advantages for obese parturients undergoing cesarean sections, including fewer puncture attempts, higher success rates, and improved maternal satisfaction.

12AP13-3

Case report: Horner's syndrome following interscalene block in a 24-year-old female undergoing shoulder arthroscopy

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Background: Horner's syndrome (HS) is a rare neurological condition resulting from disruption of sympathetic nerve pathways to the eye, characterized by ptosis, miosis, anhidrosis, and enophthalmos. It can occur after an interscalene brachial plexus block (ISB), a complication due to local anesthetic affecting sympathetic fibers near the brachial plexus. This case describes a young female who developed HS following an ISB for shoulder arthroscopy, highlighting the importance of recognizing this complication in elective surgeries.

Case Report: A 24-year-old female with no significant medical history was scheduled for elective arthroscopic shoulder surgery due to recurrent dislocations. Preoperative examination and lab tests were normal. The anesthesia plan included a single-shot interscalene block with 15 mL of 0.25% levobupivacaine. The block was performed without incident, and the patient was positioned for surgery.

Approximately 20 minutes post-block, the patient developed ptosis, miosis, and mild anhidrosis on the right side of her face. Surgery proceeded without complication under general anesthesia, and the patient remained hemodynamically stable. In the recovery unit, Horner's syndrome persisted for about 24 hours. Neurological exams, including brain and cervical spine MRI, were normal. The patient was discharged, and by the second postoperative day, the symptoms had resolved fully.

Discussion: HS following ISB, while rare, is well-documented. Sympathetic nerve fibers near the brachial plexus can be affected by local anesthetics, causing the characteristic signs of HS. Although transient and self-limited in most cases, early recognition is important to avoid misdiagnosis of more serious conditions like brainstem lesions or carotid artery dissection. In this case, imaging excluded other causes, confirming the block as the likely source.

Previous reports suggest that HS may occur with higher volumes of anesthetic or suboptimal needle placement. However, in this case, the condition resolved without intervention, reinforcing its typically benign nature.

Learning Points:

- Horner's syndrome is a rare but important complication of ISB caused by inadvertent sympathetic nerve blockade.
- The condition is usually transient and resolves without treatment.
- Early recognition is crucial to differentiate HS from other neurological conditions.
- Proper technique and volume control during ISB can help minimize the risk of sympathetic nerve involvement.

12AP13-5

Comparison between epidural analgesia and intrathecal opioid analgesia for pain management in open nephrectomy: a prospective randomized controlled pilot study

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Background and Goal of Study: Open nephrectomy is associated with significant postoperative pain, which can impair patient recovery.

In this study, we compared two different approaches to pain management regarding acute pain during the first 24 hours.

Materials and Methods: Patients undergoing open nephrectomy were randomized to one of the two groups: epidural analgesia (Control) or intrathecal opioid (Intervention) group.

The intervention group received 300 mcg of morphine intrathecally before the general anesthesia, while the control group received a continuous infusion of levobupivacaine during the postoperative period.

The main outcome was the difference in pain on the numeric rating scale (NRS score) 24 hours after the procedure. NRS was recorded postoperatively at rest and during movement.

Secondary outcomes were the incidence of adverse effects, systemic analgesics consumption, and hospital LoS.

Demographic data were analyzed using descriptive statistics. As appropriate, group comparisons were compared using the Mann-Whitney U-test or Chi-squared tests.

Results and Discussion: Sixteen patients were randomized in this pilot study: 9 in the intervention group and 7 in the control group There was no statistically significant difference in NRS score after 24 h between the two groups at rest as well as during movement.

There was also no difference in secondary outcomes. Results are shown in Table 1.

Outcomes	Intervention	Control	P value
NRS score at 24 h			
At rest	3 (2-5)	3 (1.5-4.5)	0.748
At movement	5 (4-5)	5 (4-6)	0.616
Total amount of rescue analgesia during 24 h			
Metamizole, g	2.5 (2.5-5)	2.5 (2.5-5)	0.476
Tramadol, mg	0	0	
Total amount of rescue analgesia during 72 h			
Metamizole, g	7.5 (5-7.5)	7.5 (6.25-8.75)	1
Tramadol, mg	0	0	

Table 1. Comparison of outcomes. Results are presented as medians (IQR)

Modern multimodal approaches for perioperative care often include epidural analgesia. However, various adverse effects need to be taken into consideration. Intrathecally administered opioids can produce a specific analgesic effect with fewer motor, sensory, or autonomic side effects when used in the appropriate dosage. Conclusion: Intrathecal analgesia with morphine provides the same level of postoperative analgesia as epidural analgesia with-

12AP13-6

Rebound pain occurrence in patients undergoing forefoot bone surgery under popliteal sciatic nerve block or distal sensory ankle block

out an increased incidence of adverse effects.

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Background and Goal of Study: Rebound pain (RP) when peripheral nerve block (PNB) wears off affects nearly 50% of patients (1). The underlying mechanisms of RP remain poorly understood but induced inflammation at surgical site might play a role (1-2). Forefoot surgery can be performed under either ankle block (AB, sensory block) or popliteal sciatic nerve block (PSNB, mixed motor/sensory block). This study compares RP incidence between PSNB and AB and questions the role of local inflammation (3).

Materials and Methods: Patients were randomized to receive either ultrasound-guided PSNB or AB with 0.5% ropivacaine followed by standardized general anesthesia. RP was defined as severe pain (NRS > 7; NRS 0-10) within 12 to 24 hours after PNB resolution. Repeated measures of foot temperature and oxygen perfusion near the surgical site (INVOS) were used as indirect assessment of local inflammation. Chi-squared tests and a mixed linear model will be used for statistical analysis.

Results and Discussion: 54 were analyzed. No difference in RP occurrence was observed between PSNB 36% (9/25) and AB 31% (9/29) groups and (p=0.92). Temperature elevation and IN-VOS values did not differ according to the type of block. Only temperature elevation was significantly associated with time (p=0.01) and RP occurrence (p=0.04), (Table 1).

Conclusion(s): According to these preliminary results, RP in forefoot surgery does not depend on the type of PNB but is correlated with foot local temperature increase (i.e., with the degree of local inflammation induced by surgery and facilitated by the PNB (3)).

Dependent Variable	Explanatory Factor	F Value	DDL (Denominator)	p-Value
	4 time points	4.26	35.61	0 .01*
Temperature	Occurrence of RP (yes/no)	4.54	39.38	0 .04*
	Type of PNB (PSNB vs AB)	0.32	40.34	0.56
	4 time points	2.59	35.68	0.07
INVOS Values	Occurrence of RP (yes/no)	1.79	40.70	0.19
	Type of PNB (PSNBys AB)	0.58	41 95	0.45

Table 1: Results of Mixed Linear Analysis

F Value: statistic calculated to assess the significance of each explanatory variable

DDL: degrees of freedom for the denominator of the F statistic

p-Value: statistical significance of the F value for each explanatory factor *statistically significant results (p-value < 0.05)

4 time(t) points: t1=Pre-block time/t2=Post-block time/t3=Time in the recovery room/ t4=Day 1 time

References:

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12AP13-7

Walant technique for clavicle surgery, regarding

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Background: The WALANT (Wide awake local anesthesia no tourniquet) locoregional anesthesia technique has been developed to avoid the use of ischemia in various surgical procedures (1), thereby obtaining the advantages of avoiding its use.

We present the case of a healthy 37-year-old patient who suffered trauma while riding a bicycle, thus sustaining a fracture of the middle third of the clavicle (the most frequent location of this fracture).

Case Report: Using ultrasound, we infiltrated the superficial cervical plexus with 0.75% ropivacaine in 5 ml to anesthetize the area that the surgeons were going to work on, which in the vast majority of cases depends on the supraclavicular nerve. Next, we used a 100 ml solution of 0.2% ropivacaine to which 1 mg of adrenaline was added. This infiltration was performed at different levels (distributing the 100 ml to the different points shown below):

- · At the perifracture level.
- Subcutaneous plane at the level of the surgical incision.
- · At the level of the entire anterior cortex of the clavicle, including the proximal and distal third.

After using the 100 ml of the solution, an ultrasound scan was performed, both in the longitudinal and axial plane, thus verifying that the bone was bathed in the anesthetic solution.

Discussion: We waited 5-10 minutes and checked that the patient was able to mobilize the ipsilateral upper limb without pain. The surgery was carried out without the patient showing any pain and with little bleeding seen in the surgical field aspirator (2). This technique was accompanied by sedation for the patient's comfort.

References:

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Learning Points: In conclusion, this is a novel technique that is currently performed in few centers, since it involves a learning curve for the anesthesiologist as well as a certain consensus and familiarity with the surgeons. But there is no doubt that this is the future of regional anesthesia in many procedures.

12AP13-8

Suprainguinal Fascia Iliaca Nerve Block as the anesthetic option of a Child Pugh C patient for a percutaneous fixation of hip fracture - a case report

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Background: Managing anesthesia in Child Pugh C (CPC) patients is challenging due to coagulopathy, hyperdynamic circulation, and increased perioperative risks.

This case highlights the use of a suprainguinal fascia iliaca nerve block (SFINB) as an alternative to general anesthesia (GA) or neuraxial anesthesia (NA) in a high-risk patient undergoing hip fracture (HF) fixation.

Case Report: A 57-year-old female, ASA IV, with ethanol-related cirrhosis and CPC, presented with an unstable pertrochanteric fracture. Preoperatively, hematological optimization included transfusion of red blood cells (RBC), fresh frozen plasma (FFP), platelets, albumin, and placement of a subclavian central venous catheter.

Intraoperatively, after standard monitoring, an invasive arterial line was placed, followed by ultrasound-guided SFINB with 40mL of 0.5% ropivacaine.

Adequate sensory block was confirmed 15 minutes later, and remifentanil was initiated (max dose 0.05 ug/kg/min). The patient remained responsive, cooperative, and hemodynamically (HD) stable despite 800mL estimated blood loss.

Over 2 hours, she received 2 units of RBC, 2 of FFP, 1 of platelets, and 1g of tranexamic acid. The patient was transferred to a high-dependency unit for 2 days of HD monitoring before being discharged to the ward.

Discussion: CPC patients face higher perioperative morbidity and mortality due to coagulopathy and other complications. NA is often contraindicated, while GA poses HD challenges1.

SFINB offers a safe alternative by targeting the nerves beneath the iliacus muscle's fascia, avoiding the systemic complications. Though its use as primary anesthesia for hip surgery in cirrhotic patients is rare, it is gaining support in the literature as a viable option when traditional anesthetic approaches are not ideal2.

This case emphasizes the importance of tailored, multidisciplinary perioperative care.

Learning Points: Individualized, multidisciplinary planning is essential in managing complex cases like HF in CPC patients. SFINB is a reliable anesthetic alternative for high-risk patients with severe liver disease, minimizing complications associated with GA and NA.

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12AP13-9

Anterior Quadratum Lumborum Block analgesia for total hip arthroplasty: a case report

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Background: The quadratum lumborum block (QLB) is one of several techniques that revolutionized modern regional anesthesia. First described in 2007, QLB is now used for analgesia in abdominal surgeries and also some orthopedic procedures.¹

We are presenting a case of the use of anterior QLB analgesia in postoperative pain control for total hip arthroplasty.

Case Report: A 76-year-old patient was admitted for total right hip arthroplasty. He had many comorbidities, history of postoperative pain and a difficult airway.

Intraoperatively, a single-shot ultrasound-guided anterior QLB was performed using a curved probe and a 100mm Tuohy needle, and a total of 20mL of 0.5% ropivacaine was administered. Subsequently, spinal anesthesia was conducted.

Postoperative pain control was effective, as well as early ambulation and prophylaxis for deep vein thrombosis and infection. No additional opioid analgesics were required. The surgery and anesthesia were uneventful.

Discussion: Total hip arthroplasty is a common procedure and often causes significant postoperative pain. The advanced age and comorbidities of typical patients amplify anesthetic challenges. In light of the current evidence, QLB appears to be a viable analgesic option for hip surgery, especially the anterior approach, as it facilitates the continuous spread of local anesthetics to the lumbar plexus, providing a consistent analgesic block.1

It offers the advantages typical of regional anesthesia, including enhanced pain control, reduced opioid consumption and lower pain scores.2

Additionally, evidence seems to indicate minimal motor weakness compared to placebo, facilitating faster recovery and earlier discharge, as demonstrated in this case.3

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- 2. Hutton, M., Brull, R. & Macfarlane, A. J. R. Regional anaesthesia and outcomes. BJA Educ 18, 52-56 (2018).
- 3. Tanggaard, K. et al. No quadriceps muscle weakness following anterior quadratus lumborum block compared with placebo: a randomized, non-inferiority, blinded, volunteer trial. Reg Anesth Pain Med rapm-2024-105313 (2024) doi:10.1136/rapm-2024-105313

Learning points: Anterior QLB seems to offer effective postoperative pain control and a fast recovery in total hip arthroplasty, minimizing opioid use and complications.

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12AP13-11

Comparison of postoperative analgesic effects of intrathecal morphine and modified thoracoabdominal nerve block with perichondrial approach in patients undergoing major abdominal surgery: a prospective randomized study

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Background and Goal of Study: Aim was to compare the efficacy of intrathecal morphine(ITM) and the modified thoracoabdominal nerve block with a perichondrial approach (M-TAPA) for postoperative pain management in patients undergoing major open abdominal surgery.

The primary outcome was the total opioid consumption within the first 24 hours postoperatively (measured in morphine milligram equivalents, MME).

Secondary outcomes included resting and mobilization Numeric Rating Scale (NRS) scores and the incidence of postoperative side effects.

Materials and Methods: In this prospective, randomized, singleblind study, 50 patients with an American Society of Anesthesiologists (ASA) physical status classification of I-III were randomly assigned to one of two groups: ITM (25 patients) or M-TAPA (25

Preoperatively, the ITM group received 200 mcg of intrathecal morphine, while the M-TAPA group underwent bilateral nerve blocks with 20 mL of 0.25% bupivacaine per side.

Postoperative pain management included patient-controlled analgesia (PCA) with 1 mg/mL intravenous(IV) morphine, IV paracetamol (4x1 g), and rescue analgesia with tramadol (1.5 mg/kglV) for NRS>3. Opioid consumption (MME), NRS scores, side effects, and rescue analgesic use were recorded at 2, 6, 12, 24, 36, and 48 hours postoperatively.

Results and Discussion: Total 24-hour opioid consumption(MME) was significantly lower in the ITM group compared to the M-TAPA group (9.72 \pm 6.32 mg vs. 14.96 \pm 8.51 mg, p=0.025,95% CI:-9.51,-0.97). During the first 6 hours and the 36-48-hour interval, opioid consumption were comparable among the groups.

However, in the 6-12, 12-24, and 24-36-hour intervals, opioid consumptions were significantly lower in the ITM group (1.44 \pm $2.71 \text{ mg}, 2.20 \pm 2.59 \text{ mg}, \text{ and } 2.48 \pm 1.64 \text{ mg}, \text{ respectively, p<0.001},$ p<0.001, p=0.007; 95% Cl:-3.13,-0.23; 95% Cl:-5.34,-1.06; 95% CI:-3.06,-0.55).

Resting and mobilization NRS scores were both consistently <4 across all time points in both groups. The mean duration of the M-TAPA sensory block was 7.68 ± 2.98 hours.

Postoperative pruritus occurred in one patient in the ITM group. The incidence of nausea and vomiting was similar between the two groups.

Conclusion(s): Opioid consumption was significantly lower in the ITM group compared to the M-TAPA group, likely due to differences in the duration of analgesic effects between the two techniques. Future studies should explore the efficacy of extendedduration M-TAPA techniques in comparison to ITM.

12AP13-12

A tailored anaesthetic approach: continuous subarachnoid block for an 87-year-old with hip fracture

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Background: General and neuraxial anaesthesia are often associated with significant hemodynamic instability¹, particularly in frail, high-risk patients. Continuous subarachnoid block (CSB) enables precise titration of local anaesthetics, achieving an optimal level of sensory blockade while minimizing cardiovascular perturbations2.

This case report describes the successful use of CSB in a frail patient undergoing surgical repair of a hip fracture.

Case Report: An 87-year-old female, ASA III, presented for hip fracture repair. Frail with a BMI of 15.8 (38 kg), her medical history included hypothyroidism and recurrent deep vein thrombosis managed with dabigatran.

Following anticoagulation suspension and confirmation of normal coagulation parameters, informed consent was obtained. Standard ASA monitoring was instituted. A CSB was performed with the patient positioned in the right lateral decubitus using an 18G Tuohy needle inserted at the L3-L4 interspace via a median approach.

Once cerebrospinal fluid flow was confirmed, a catheter was introduced, and the patient was repositioned supine. An initial 2.5 mg dose of isobaric bupivacaine 0.5%, followed by a saline bolus, achieved a T8 sensory block.

An additional 1 mg of bupivacaine was administered to address mild positional discomfort before surgery, which lasted 45 minutes. Standard multimodal analgesia (ketorolac, paracetamol) and prophylactic ondansetron were provided. The patient remained hemodynamically stable throughout, with no requirement for vasoactive medications.

The catheter was removed at the end of the procedure, and the patient was transferred to the post-anaesthesia care unit. Postoperatively, no complications, including post-dural puncture headache, were reported.

Discussion: This case highlights the safety and efficacy of CSB in frail elderly patients requiring orthopedic surgery. CSB facilitates titrated neuraxial anaesthesia with reduced local anaesthetic doses, mitigating hemodynamic instability. It is a valuable anaesthetic option for high-risk populations.

References:

1. Koole, C., et al. (2024). Haemodynamic effects of continuous spinal anaesthesia. British Journal of Anaesthesia, 132(5), 1160-1162

2. Hay, R., & Gupta, A. (2022). Continuous spinal anaesthesia. BJA Education, 22(8), 295-297.

Learning points: CSB delivers titrated anaesthesia effectively with minimal cardiovascular impact. It is a safe, reliable option for high-risk, frail patients undergoing orthopedic procedures.

12AP14-1

Facilitating weaning in an ICU patient with necrotizing fasciitis using bilateral infraclavicular catheters: a case report

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Background: Pain management in ICU patients is challenging. While opioids are commonly used, their side effects make them suboptimal in critically ill patients. Regional analgesia techniques provide an alternative, reducing opioid and sedative requirements while improving patient comfort.

This case report demonstrates how regional analgesia can address pain management challenges and facilitate weaning.

Case Report: We describe a 78-year-old man referred to our hospital for necrotizing fasciitis in both forearms. He underwent urgent escharotomy and debridement and was admitted to the ICU postoperatively. Severe pain during wound care persisted despite a multimodal analgesic regimen, including continuous morphine and esketamine infusions.

Additional opioid and propofol boluses were required for each wound care session. Bilateral infraclavicular nerve blocks with perineural catheters for continuous local anesthetic infusion were performed. This intervention effectively managed the patient's pain, allowing for discontinuation of opioids and facilitating extubation within 48 hours.

Discussion: This case highlights the challenges of managing severe pain in critically ill patients and underscores the potential of regional anesthesia as an alternative to systemic opioids and sedatives. To our knowledge, this is the first reported case of using bilateral infraclavicular catheters in an ICU patient to facilitate weaning.

Infraclavicular blocks provide effective pain relief for the arm, elbow, and hand without risking phrenic nerve blockade. They also allow for catheter placement to enable continuous or bolus administration.

Despite their benefits, regional blocks in ICU patients can pose challenges due to complex pathologies and treatments. Sedated ICU patients are at increased risk for local anesthetic systemic toxicity (LAST) due to continuous local anesthetic administration and the lack of specific warning signs.

References:

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- 2. Lazar, A. et al. Challenges of the regional anesthetic techniques in intensive care units: A narrative review.
- 3. Guedes, L. et al. Analgesia regional em cuidados intensivos.

Learning Points: Regional analgesia is a safe and effective option for critically ill patients. However, further research is needed to optimize local anesthetic dosing and minimize the risk of systemic toxicity in this vulnerable population.

12AP14-2

Don't unnecessarily touch the patient: case report

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Background: Epidermolysis bullosa is a rare disease with skin and mucosal bullae formation due to minor mechanical trauma as its hallmark. These blisters heal with scars and strictures which can possibly lead to difficult airway management and esophageal strictures with inability for nutritional intake leading to anemia and malabsorption1.

Case Report: A 36 years old female patient was admitted for left forearm amputation due to aggressive cutaneous cancer. Her medical history revealed a rare disease Epidermolysis bullosa. Preoperatively she suffered from severe iron deficiency anemia with hemoglobin level 49 g/L, which was corrected prior surgery to 87 g/L.

Due to her condition, precautionary measures for avoiding new bullae formation were taken. A decision for regional anesthesia with ultrasound guided infraclavicular block with lidocaine 100 mg and bupivacaine 60 mg was made. She was sedated with 2 mg midazolam, 50 mg ketamine and low dose propofol and 50 mcg fentanyl prior to performing the block.

Due to persistent anemia she received one more package of erythrocytes concentrate and 1g TXA. She recovered well after surgery.

Discussion: Regional anesthesia is favoured because of the potential difficult airway management, increased risk of aspiration and limited mouth opening, but avoiding puncture near open wounds is important because of increased infection risk1.

Another challenge is placing the various monitoring devices without further damage by them. Wrap-around pulse oximeter secured with coban, avoiding tourniquet and adhesive electrodes are mandatory.

Reference:

1. Saraf SV, Mandawade NJ and al. Epidermolysis bullosa: Careful monitoring and no touch principle for anesthesia management. J Anaesthesiol Clin Pharmacol. 2013 Jul;29(3):390-3. doi:10.4103/0970-9185.117112. 2. Mittal BM, Goodnough CL et al. Anesthetic Management of Adults With Epidermolysis Bullosa. Anesth Analg. 2022 Jan 1;134(1):90-101. doi:10.1213/ANE.0000000000005706.

Learning points: Multidisciplinary team approach is needed for planning and optimizing the patient with this disease before any surgery. Preparation of the operating room and modified care by every staff member is needed for proper treatment².

12AP14-3

The importance of ergonomics: a case report

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Backgroud: Ergonomics in relation to anaesthesia is the scientific study of the interaction between anaesthetists and their workspace environment in order to promote safety, performance and well-being.1

Everyday, anesthesiologists are presented with challenging cases, high risk patients and surgeries, difficult procedures and techniques. We must strive to optimize ergonomic factors at every step of the way, so that we can improve outcomes for both our patients and ourselves.

Case report: A 75 years old woman presented for total knee arthroplasty revision. She was obese and had multiple cardiovascular comorbidities. She had a history of two previous knee interventions under general anesthesia, and mentioned that in both surgeries the anesthesiologists tried to perform neuraxial techniques unsuccessfully.

Given the comorbidities, consent to perform spinal anesthesia was still obtained, with the possibility of conversion to general anesthesia. All the conditions for the technique were optimized: the procedure was explained to the patient, the positioning perfected and she was lightly sedated; the OR was calm and quiet with sufficient lighting; the sterile field was spacious allowing for landmark identification; all the equipment was ready to use and an experienced assistant was present; the operator was comfortably sitting and a successful spinal was performed, in the first try, by an anesthesiology resident through a midline approach to the L4-L5 space.

The patient was positioned for surgery and the team was prepared to start. Unfortunately, the block level was insufficient. Another spinal was attempted by the same resident. At that point the same extent in optimization was not obtained, in the positioning of the patient and the operator, and in the environment or equipment. After multiple tries (>5), with different approaches, the technique was unsuccessful.

Then, the senior anesthesiologist experienced the same difficulties but after multiple attempts (>5) completed the technique and the surgery was performed under regional anesthesia without complications.

Discussion: Since the first attempt at spinal anesthesia was easily achieved, the team chose to repeat the technique and complement the local anesthetic dose. As the conditions were not optimized, the technique revealed much more demanding.

Reference:

1. Anaesthesia vol. 76,12 (2021): 1635-1647

Learning points: During a procedure, optimization of every attempt is crucial for a successful result.

12AP14-4

A randomised controlled study on bilateral ultrasound guided erector spinae block for postoperative analgesia in lumbar spine fusion surgery

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Background and Goal of Study: ESPB is one of the newer interfascial techniques and we conducted a prospective randomised controlled trial to study the efficacy of USG ESPB in lumbar spine surgeries by assessing the NRS score and total quantity of opioids consumed.

Materials and Methods: A prospective RCT was conducted on 40 patients and were enrolled in two groups;

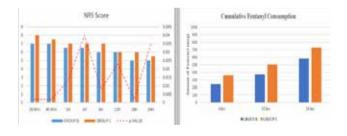
Group B: patients received bilateral USG ESPB using 0.2% Ropivacaine -20ml and I.V PCA fentanyl;

Group C patients received only I.V PCA fentanyl as post operative analgesia. We had monitored haemodynamic parameters, total opioid consumption, NRS scores and post operative side effects like PONV and sedation were recorded up to 24 hours postoperatively. Continuous data of the two groups were compared using student t-test and NRS score using Mann Whitney U test. Chi square was used to compare categorical data.

Results and Discussion: Fentanyl consumption in group B versus group C at 6hours (112 \pm 78 vs 292 \pm 77 mcg, p<0.001), 12 hours $(151 \pm 103 \text{ vs } 478 \pm 151 \text{ mcg}, p<0.001)$ and 24 hours $(219 \pm 158 \text{ vs})$ 745 ± 291 mcg, p<0.001) were statistically significant.

The incidence of nausea was higher in group C (66.6%) compared to group B (23.8%).

Around 95.2% of patients in group B were satisfied with the guality of postoperative pain relief when compared to 33.3% of patients in group C.



PARAMETERS	GROUP B / BLOCK (N=20)	GROUP C / CONTROL (N=20)	P VALUE
NRS	5-7	5-8	<0.05*
FENTANYL -6HRS	244+-58	363+-56	<0.001*
12HRS	373+-76	504+-80	<0.001*
24HRS	582+-91	728+-92	<0.001*
NAUSEA	6(30%)	13(65%)	0.026*
VOMITING	4(20%)	7(35%)	0.289 (NOT SIGNIFICANT)
SEDATION -SCORE 1	19(95%)	11(55%)	0.000*
SCORE 2	1(5%)	9(45%)	0.003*
PATIENT SATISFACTION	16(80%)	8(40%)	0.009*

Conclusion(s): In our study, the NRS, post operative opioid consumption, PONV, and sedation scores were significantly lower in patients with ESPB. Hence, ESPB could be used as a part of multimodal analgesia in lumbar spine fusion surgeries.

Reference:

Singh S, Choudhary NK, Lalin D, Verma VK. Bilateral ultrasound-guided erector spinae plane block for postoperative analgesia in lumbar spine surgery: a randomized control trial. Journal of neurosurgical anesthesiology. 2020 Oct 1;32(4):330-4.

12AP14-5

The association between epidural analgesia and intrapartum maternal temperature trajectories

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Background and Goal of Study: Epidural analgesia is associated with intrapartum maternal fever (temperature ≥38.0°C), which may independently be associated with adverse neonatal outcomes. The aim of this study was to establish the incidence of fever in a healthy cohort, and to compare temperature trajectories by epidural provision.

Materials and Methods: The Pregnancy Pattern Physiology Prediction (4P) study was a multi-centre, longitudinal, observational cohort study conducted in the UK. It recruited women who met the criteria for a normal, healthy pregnancy as defined by the American Society of Anaesthetists Grade 1 (ASA-1). We extracted intrapartum temperature from the partograph and plotted the trajectories for epidural and non-epidural groups as smoothed contiles.

Results and Discussion: In this study of 1,054 women recruited in early pregnancy, 596 women contributed at least one intrapartum temperature. Women who used epidural analgesia (n = 220) were more likely to be nulliparous (69.1% vs 45.7%), to have an intrapartum caesarean birth (19.1% vs 6.6%), and have a longer labour (12.1 \pm 5.7 hours vs 7.6 \pm 4.7 hours) than those who did not use epidural analgesia (n = 376). There were similar rates of fever in the epidural (1.8% (4/220)) and non-epidural (1.1% (4/376)) cohorts (odds ratio 1.7, 95% confidence interval 0.3 – 9.3). The median temperature trajectories across the intrapartum period were also similar for both cohorts (Figure 1). The change in the temperature trajectory of the epidural cohort post epidural provision in a mixed-effects model was minor (0.06°C/hour). The conclusions did not change when investigating the effects of confounding or mediating factors such as parity or length of labour.

Conclusion(s): In this observational study of healthy women, fever rates were low and there was little association of epidurals with maternal fever or temperature trajectories. The low fever incidence in this study may be attributable to the observational nature of the study and ASA-1 restriction. We conclude that maternal fever should not be dismissed as being epidural induced in clinical practice.

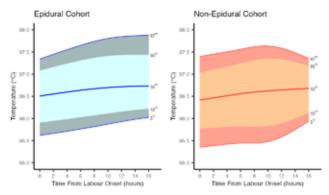


Figure 1. Intrapartum temperature trajectory with respect to labour onset.

12AP14-6

Comparison the impact of the method of anaesthesia on intraoperative nociceptive response throughout spine surgeries: prospective randomised control trial

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Background and Goal of Study: Surgical intervention triggers nociception, whereas the main aim of anaesthesia is to suppress nociceptive signal processing. The impact of different methods of anaesthesia on the nociception response and its correlation with postoperative outcomes remain unclear. Regional anaesthesia affects transduction, transmission, and modulation by interrupting the conduction of pain impulses by local anaesthetics.

Moreover, nerve blocks influence perception by reducing sensitization and tolerance to pain by reducing opioid consumption (OC). Owing to this mechanism, an essential balance between nociception and antinociception is sustained, and violation of this balance can lead to postoperative complications.

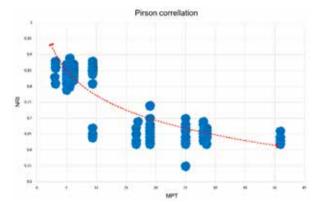
Aim: To compare the impact of general anaesthesia (GA) with erector spinae plane block (ESPB) versus GA without ESPB on intraoperative nociceptive response index (NRI), OC, postoperative pain intensity (PPI), and hyperalgesia in patients undergoing spine surgery.

Materials and Methods: This prospective, randomized-controlled study was conduct in clinical hospital with affiliate university department, from December 2021 and November 2022. 151 patients who underwent spine surgery with the posterior approach were randomly assigned to either the GA control group (CG) or GA with ESPB study group (SG). Outcomes: NRI, OC, PPI and hyperalgesia. ClinicalTrials.gov: NCT04697498

Results and Discussion: Average NRI throughout surgery differed between groups: $SG - 0.66\pm0.28$; $CG - 0.86\pm0.19$. Amount of fentanyl and morphine was lower in SG (1.84±0.75µg kg-1; 5.62±5.00mg) compared to CG (3.64±1.2µg kg-1; 28.97±9.75mg) correspondingly.

PPI at rest and during movement was higher in the CG after surgery than in the SG at all stages of observation. mechanical pain threshold (MPT) did not differ before surgery: $SG - 21.05\pm6.64$; $CG - 21.55\pm6.06$.

After surgery, MPT was lower in the CG - 5.60±1.93 than in the SG - 23.26±6.8. The NRI had the strongest negative correlation with hyperalgesia in comparison with the other data.



Conclusion(s): ESPB, as a component of GA, decreases NRI, OC, and PPI and, as a result, does not trigger hyperalgesia after spine surgery.

12AP14-7

Combined lumbar erector spinae plane and femoral nerve block in open femoral artery pseudoaneurysm repair surgery, a case report

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Background: Open vascular surgery in the pelvis and lower body typically requires neuraxial anesthesia. This case report describes the use of a lumbar erector spinae plane (ESP) block as an alternative when neuraxial anesthesia is contraindicated.

Case Report: A 78-year-old patient with COPD and atrial fibrillation on Warfarin underwent endograft placement for an abdominal aortic aneurysm. During the procedure, a tear in the left femoral artery led to a pseudoaneurysm, necessitating surgical repair a few days later. The repair involved a 15 cm incision across the inguinal ligament, but the patient's comorbidities and INR > 2.5 made both neuraxial and general anesthesia unfeasible.

A lumbar ESP block was performed at L1-L2 transverse processes with 20 mL of 0.5% levobupivacaine, alongside a femoral nerve block with 10 mL of 0.5% lidocaine and 1% mepivacaine, plus light sedation with 5 mg of midazolam (RASS -1). Spontaneous breathing and hemodynamic stability were maintained, and the 30-minute procedure was completed without complications.

Discussion: First time, the ESP block has been used for postoperative pain management in thoracic1, abdominal, and orthopedic surgeries. No literature, however, documents its application as a primary anesthetic in vascular surgery.

Given the variable sensory block associated with the ESP block2, a femoral nerve block was added to ensure analgesia of the thigh's surgical area.

Regarding anticoagulation, the ESP block's distance from major neural and vascular structures minimizes the risk of significant hematomas, despite theoretical concerns of compression in the erector spinae muscles.

References:

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Learning Points: Based on our experience, lumbar ESP combined with femoral nerve block appears to be a safe and effective anesthetic alternative for emergency patients on anticoagulant therapy for surgeries in the inguinal and suprainguinal areas.

12AP14-8

The role of the thoracolumbar interfascial plane (TLIP) block in managing intraoperative opioid requirements for lumbar spinal surgery

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Background and Goal of Study: Lumbar spinal surgery frequently leads to significant pain, requiring substantial opioid doses for effective intraoperative pain management. Unfortunately, these high doses can lead to considerable adverse effects. The thoracolumbar interfascial plane (TLIP) block, a relatively new regional anesthesia technique, offers promising potential as part of multimodal analgesia to reduce opioid use.

Although not yet widely implemented, the TLIP block is gaining attention alongside other fascial plane blocks, such as the erector spinae plane (ESP) block, for their potential to enhance pain

This study evaluates the effect of the TLIP block on intraoperative opioid consumption in adults undergoing lumbar spinal surgery.

Materials and Methods: This prospective, randomized, casecontrol study included 98 adult patients scheduled for elective lumbar spinal surgery in a tertiary care academic hospital.

After ethics committee approval and patients' informed consent, patients were randomly assigned to two groups. The TLIP group (n=51) received general anesthesia (GA) with bilateral ultrasoundguided TLIP block following anesthesia induction, while the control group (n=53) received GA alone. Fentanyl was the only opioid administered intraoperatively in both groups.

Fentanyl consumption between groups was compared using independent samples t-tests, with significance set at p<0.05. Statistical analysis was conducted using IBM SPSS for Windows, version 29.

Results and Discussion: The TLIP group demonstrated significantly lower intraoperative fentanyl consumption compared to the control group: 229.4 \pm 64.2 mcg vs. 283.02 \pm 101.4 mcg (mean values and standard deviations respectively), p=0.0018. All control group patients required supplemental fentanyl doses,

whereas only 5 patients in the TLIP group needed additional fentanyl. These results indicate the TLIP block's efficacy in reducing opioid requirements.

Conclusion(s): The TLIP block significantly reduces intraoperative opioid requirements in lumbar spinal surgery, underlining its value as a promising analgesic strategy. Further studies should investigate its broader benefits, including effects on intraoperative blood loss, postoperative pain relief, and opioid-related complications. Comparative studies examining the TLIP block alongside other fascial blocks, such as the ESP block, will help refine clinical practice and optimize pain management strategies.

12AP14-9

Postoperative motor weakness related to lumbar erector spinae plane block: case reports

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Background: Lumbar erector spinae plane block (ESPB) is considered a safe, effective opioid-sparing technique for postoperative pain management after spinal fusion surgery. This report describes two cases of postoperative lower limb weakness following lumbar ESPB for L5-S1 arthrodesis.

Case Report: Following general anaesthesia (GA), in a 56-yo ASA I patient, a ESPB (20ml of 0.3% ropivacaine per side) was performed under ultrasound guidance in the prone position. An in-plane cephalocaudal approach (80 mm needle) was used to reach the transverse process of L5. Postoperatively, the patient experienced right foot dorsiflexor paresis prompting a magnetic resonance imaging (MRI) and electromyography, which showed no surgical complications. Recovery was complete within 31 hours (hrs). Second patient, 46-yo ASA II, received an ESPB (20 ml of 0.35% ropivacaine per side). Postoperatively, the patient experienced complete left lower limb paralysis. An MRI also ruled out complications. Motor recovery was complete within 24 hrs. In both cases, the transient lower limb paralysis was attributed to ESPB.

Discussion: Few case reports describe transient lower limb motor weakness or paralysis following lumbar ESPB. Selvi (1) observed motor weakness after an out-of-plane ESPB (25ml of bupivacaine 0.3% + lidocaine 0.1%) for cesarean section under GA resolving within 16 hrs. Another case with in-plane ESPB (40 ml bupivacaine 0.25% + lidocaine 0.5%) resulted in T10–S4 motor block, recovering in 14 hrs. (2). Similarly, two patients receiving out-of-plane ESPB (20ml bupivacaine 0.25%) before lumbar surgery experienced a sensory-motor blocks lasting 1.5 hrs (3). Possible explanations include local anaesthetic spread to the ventral ramus, posterior epidural space, or lumbar plexus.

References:

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Learning points: Lumbar ESPB can be complicated by transient lower limb paralysis. This seems to be rare as few cases have been reported. The mechanism is still not clear. Anesthesiologists and surgeons should be aware of this possible complication.

12AP14-10

Transversus Abdominis Plane (TAP) block in patients undergoing colorectal surgery

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Background and Goal of Study: Epidural anesthesia (EA) is considered the gold standard for analgesia during colorectal surgery. However, a number of complications and contraindications require the search for other methods anesthesia[1]. An alternative to EA can be the use of Transversus Abdominis Plane (TAP) block [2]. The aim of the study is to evaluate and compare the effects of EA and TAP block on analgesia, hemodynamics, and recovery of patients undergoing colorectal surgery.

Materials and Methods: Patients undergoing colorectal surgeries were evaluated. Group A received EA at the T11-T12 level, followed by intraoperative administration of 0.25% bupivacaine 6 ml/hour. Group B received a lateral TAP block under ultrasound guidance with the administration of 20 ml of 0.25% bupivacaine on each side. Intra- and postoperative hemodynamic parameters, pain levels using the VAS at 0, 6, 24 hours after surgery, frequency of adverse reactions were recorded.

Results and Discussion: In the study 21 patients were included. Group A-15, Group B- 6 patients. In Group A, intraoperatively lower systolic blood pressure values (89.8±10.56 vs. 95.83±8.05), heart rates at 1, 6 and 12 hours postoperatively (68.8±7.89, 66.47±5.1, and 66.9±5.3 vs. 74.3±11, 74.17±6.89, and 80±9 respectively) were observed, along with a higher frequency of norepinephrine use (26.7% vs. 16.7%). Pain scores on the VAS were lower at 1 hour in Group B (1.83±0.56 vs. 1.93±1), but higher at 6 and 12 hours (3.17±1.17 vs. 1.73±1.35 and 2.3±1.67 vs. 4.5±0.8). In Group A, 13% of patients exhibited unilateral motor block, while 33% of Group B required postoperative narcotic analgesics. The incidence of nausea was 20% in Group A and 33% in Group B. Group B reported greater postoperative comfort and faster mobilization.

Conclusion(s): TAPB may serve as an alternative to epidural anesthesia during colorectal surgical procedures as it results in less complications, helps maintain stable hemodynamics, and provides effective early postoperative analgesia. This enhances patient safety in the operating room, improves treatment outcomes.

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Regional Anaesthesia 205

12AP14-11

Optimizing Anesthesia for High-Risk Patients: Scalp Block for Frontal Lobe Epithelioma **Excision**

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Background: Patients with multiple comorbidities often present challenges in their anesthesia management and regional anesthesia (RA) provides a viable alternative to general anesthesia (GA).

This case demonstrates the utility of a scalp block in providing both surgical anesthesia and effective analgesia for the wide excision of a frontal lobe epithelioma in a high-risk patient.

Case Report: An 85-year-old Caucasian male (BMI: 23.5 kg/m², METS = 4) presented for wide excision of a frontal lobe epithelioma. His medical history included arterial hypertension, atrial fibrillation, benign prostatic hyperplasia, rheumatic polymyalgia, and fatty liver disease. His medications included furosemide, pantoprazole, prednisone, hydroxychloroquine, apixaban, and amiloride. The patient was a heavy smoker and exhibited plectrodactyly. Baseline laboratory tests were within the normal range. Cardiac echocardiography revealed mitral, aortic and tricuspid regurgitation. He was categorized as ASA III, whilst he exhibited bronchial secretions, increasing the risk of respiratory complications under GA. To mitigate these risks, a RA plan was recruited. A landmark guided scalp block targeting the supraorbital, supratrochlear, zygomaticotemporal, auriculotemporal, lesser and greater occipital nerves bilaterally was performed using 1 mL of 0.5% ropivacaine and 1 mL of 1% lidocaine at each injection point. Surgical anesthesia was achieved and the 60-minute procedure was completed with the patient awake, breathing spontaneously and with no additional analgesia. Postoperatively, the patient bypassed the postanesthesia care unit (PACU) and was transferred directly to the plastic surgery ward, where the analgesic regimen consisted of paracetamol every 8 hours. Discharge followed three days later with an uneventful recovery.

Discussion: This case highlights the efficacy of RA both as the sole anesthetic plan, as well as the cornerstone of a multimodal analgesia plan, particularly in patients with multiple comorbidities. RA aligns with ERAS protocols by promoting improved postoperative outcomes, reducing PACU admission and shortening hospital stays. This case underscores how individualized anesthetic planning can optimize outcomes, particularly in frail patients with significant systemic diseases.

Learning points: RA is useful in patients with multiple comorbidities. Scalp block is an effective anesthesia and analgesia strategy for head surgery. RA enhances quality of recovery.

12AP14-12

Unusual presentation and management of local anesthetic systemic toxicity (LAST) in a high-risk patient with multiple comorbidities

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A 64-year-old lady presented with alcohol intoxication, fall at home, right displaced rib fractures (7th-10th), hemopneumothorax, severe chest pain, confusion and multiple comorbidities: COPD, emphysema, pneumonia, heavy smoking, epilepsy, low body weight (43 kgs) and albumin, deranged liver function, alcoholism, frailty,

The initial analgesic management: Panadol, NSAIDs, IV morphine with limited efficacy.

She received right ESP block, PNB catheter at T8 level. Bolus of 30 mL of 0.2%ropivacaine followed by an infusion at 2-7mL/h by pump. The VAS pain score dropped from 8 to 0 after 30 minutes after bolus and sustained for 20 hours. Patient deteriorated 20-24 hours post PNB catheter insertion with confusion, fluctuating drowsiness, hypoventilation, desaturation.

There were subtle neurological but no overt cardiovascular signs of LAST. Regional anesthesia stopped; high-flow oxygen and In-

therapy initiated: 75 mL bolus followed by 12.5 mL/min over 10 minutes. There was an

improvement in mentation. 18 hours later, the ESP block restarted via the same PNB catheter with 0.1% ropivacaine at 2-7 mL/h, effective analgesia and no recurrence of LAST symptoms.

Patient underwent rib plating with subsequent improvement. Challenges in dosing and diagnosing LAST (1) were patient's comorbidities:

hypoalbuminemia - resulting in a higher fraction of free local anaesthetic, liver dysfunction - with

decreased metabolism of the LA, anticonvulsants. The use of opioids may have masked some of the LAST(2,3) signs .The presentation was also atypical, with no cardiovascular features and the only neurological symptom was the altered mentation and no prodromal symptoms: perioral paresthesia, metallic taste, tinnitus.

Evidence-Based References:

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after axillary plexus block using lipid infusion." Anesthesia & Analgesia, 108(5), 1578-1580.

3. Picard, J., & Meek, T. (2010). "Lipid emulsion to treat overdose of local anaesthetic "Anaesthesia, 65(2), 115-120.

Learning Points are the awareness of atypical presentations in patients with altered

pharmacokinetics. Lipid emulsion therapy can reverse life-threatening LAST, even when initiated

late. Lower concentration ropivacaine may be safely reintroduced post-LAST with monitoring.

Ambulatory Anaesthesia

13AP01-1

Endoscopic retrograde cholangiopancreatography as a "treatment and discharge' day care procedure under general anaesthesia: a retrospective analysis in a tertiary care cancer centre in Oman

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Background and Goal of Study: Multiple studies have demonstrated that GA (General Anaesthesia) with endotracheal tubes reduces sedation-related adverse effects (SRAEs). We set up the concept of a "treatment and discharge" daycare facility for the GA ERCP. We did this study to evaluate the efficiency and safety of this system.

Materials and Methods: We did a descriptive analysis of retrospectively collected data of all the patients undergoing GA ERCP in our centre from the period from March 2022 to March 2024. Data was collected from the hospital information system/ Electronic medical records. Individual patient medical reports apart from the anesthesia records and endoscopy procedure notes were reviewed

Results and Discussion: 473 patients in the endoscopy suit underwent 1131 episodes of ERCP. The commonest indication for ERCP was CBD stones, followed by pancreatic malignancy. Hypertension was the commonest comorbidity. 63 % of the patients underwent stent placement, removal, or exchange and it was the most common procedure performed. Spyglass ERCP was done on 112 patients.142 (32.06 %) patients underwent sphincterotomy. In 28 patients the procedure was abandoned. The majority of the patient's ERCP was done in the prone position. In 51 it was done in a lateral position and in 23 patients in the supine position. 88 % of the episodes were done as elective. Most of the patients were either sent back to the referral hospitals or to home. 46 patients were admitted to the ward for various reasons, of which 22 patients developed post-procedure pancreatitis . The mean average time to do the ERCP in our study was 66±22.46 minutes. Most of the patients were under GA with ETTO. 36 out of 42, who were done under moderate to deep sedation were converted to GA. The average PACU time was 109±34.22 mins 139 patients developed nausea/vomiting of various grades. 63 patients had 116 episodes of hypotension amounting to 148 minutes. 36 of them required inotropic/vasopressor support, while 28 episodes of hypoxia amounting to 72 minutes.

Conclusion(s): The establishment of the local network for endoscopy procedures at daycare is safe and feasible from the anesthesia and endoscopic point of view whether elective or in an emergency. This first such ERCP network in Oman demonstrates that mild alterations in certain institutional practices can lead to optimized utilization of endoscopic facilities and patient satisfaction.

13AP01-2

Acute neurogenic pulmonary edema following electroconvulsive therapy: a case report

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Background: Neurogenic pulmonary edema (NPE) is a rare, lifethreatening complication linked to acute central nervous system (CNS) insults such as seizures. This report examines a case of NPE following electroconvulsive therapy (ECT) for refractory bipolar disorder, emphasizing the importance of timely diagnosis and management.

Case Report: A 52-year-old woman with bipolar disorder underwent elective ECT after failing pharmacologic therapy. Induction was performed with etomidate and succinvlcholine, followed by bilateral ECT. Post-seizure, the patient experienced severe hypoxemia (SpO2 of 60%), hemoptysis, and respiratory distress despite 100% oxygen supplementation. Bedside imaging revealed bilateral pulmonary opacifications consistent with edema. Immediate treatment included oxygen therapy, diuretics, and corticosteroids. The patient demonstrated gradual improvement, achieving full recovery within three days.

Discussion: The hyperadrenergic state induced by ECT likely triggered NPE, marked by elevated pulmonary capillary pressures and fluid leakage. Unlike negative pressure pulmonary edema, NPE arises from CNS-mediated sympathetic overactivation without airway obstruction. This case aligns with prior reports highlighting autonomic dysregulation during ECT. Vigilant post-ECT monitoring is critical for early detection and intervention, improving outcomes in such rare complications.

Learning Points:

NPE is a rare but severe complication of ECT requiring prompt recognition and intervention.

Pre-ECT evaluations and intra/post-procedure monitoring are vital for patient safety.

Multidisciplinary coordination optimizes management of ECTinduced complications.

References:

Smith JA, Doe JB. Electroconvulsive therapy in treatmentresistant bipolar disorder. J Psychiatr Res. 2020;75(2):112-120. Takahashi T, et al. Acute neurogenic pulmonary edema following ECT: a case report. Gen Hosp Psychiatry. 2012;34(6):703.e9-e11. Davison DL, et al. Neurogenic pulmonary edema. Crit Care. 2012;16(2):212.

13AP01-3

Is inhalational better than intravenous sedation in the MRI suite? Eleven months of Audit in a Private University Hospital

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Background: Sedation (SED) is indicated for Magnetic Resonance Imaging (MRI) in case of claustrophobia, pain or anxiety. The ideal SED should ensure immobility, avoid complications (awareness and desaturation), and allow an early discharge from hospital. We audited 11 months of SED for MRIs in a Private University Hospital.

Material and Methods: Data on MRIs performed between January and November of 2024 were retrieved concerning the SED technique (inhalational, Intravenous or mixed intravenous and inhalational), age and ASA status, number of MRI sequences, complications, SED side effects (headache or PONV) and time elapsed between the end of procedure and discharge from the hospital. We analysed risk factors for complications and delayed discharge (>30 minutes) from Hospital. p<0,05 was considered statistically significant.

Results: 198 patients (age: 56 [0,6; 82] yrs; ASA: 2 [1;4]), were scheduled for 1 [1;5] MRI sequences. 125 (63,1%) received inhalational SED versus 65 (32,8%) intravenous SED, and 8 (4,0%) mixed techniques.

Complications were observed in 52 (26,3%) cases: MRI sequence was interrupted or repeated in 42 (21,2%) cases and 27 (13,6%) patients presented a desaturation. An older age (p=0,65), greater number of sequences (p=0,47) or ASA status (p=0,29) were not associated with more complications.

SED technique had a significant influence on complications (p<0.001); the use of propofol (OR: 6.29 [3.15: 12.55], p<0.001) and midazolam (OR: 3,15 [1,51; 6,57], p<0,001) were associated with an increased risk, while sevoflurane (OR: 0,18 [0,09; 0,36]; p<0,001) decreased this risk.

A late discharge from hospital was observed in 50 (25,3%) patients: an age < 12 years (OR: 0,2 [0,04; 0,90]; p= 0,02), an exclusive use sevoflurane (OR: 3,26 [1,6; 6,63]; p=0,01), the use of propofol (OR: 0,48 [0,23; 0,99]; p=0.04) or midazolam (OR: [0,28; 0,84], p=0,01), and SED side effects (OR: 5,86 [1,64; 20,97]; p=0,003) were identified as associated factors, but not the number of MRI sequences (OR: 1,96 [0,98; 3,93]; p=0.06) or the occurrence of complications (OR: 0,85 [0,41; 1,79], p=0,72).

Discussion and Conclusions: Although sedation using inhalational techniques for MRI seems a safer procedure, it increases the time of recovery and might affect time before discharge of the patient from hospital.

References:

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2: Jerath A, Panckhurst J, Parotto M, et al., A&A, 2017 Apr:124(4):1190-1199.

13AP01-4

REZUM technique for benign prostatic hyperplasia: what is the best anesthetic treatment?

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Background and Goal of Study: Benign prostatic hyperplasia (BPH) is a prevalent condition among older men, leading to bothersome lower urinary tract symptoms (LUTS). The REZUM procedure, a minimally invasive treatment utilizing steam to ablate prostatic tissue, is an effective option for managing BPH. The choice of anesthesia or sedation for the REZUM technique is crucial for patient comfort and procedural success, yet the optimal approach remains uncertain.

Materials and Methods: A survey was conducted in 5 hospital centers where experienced anesthetists performed anesthesia to 115 male patients undergoing the REZUM procedure for BPH between 2022 and 2023. Three different anesthesia methods were compared: local anesthesia with conscious sedation (Group A), spinal anesthesia (Group B), and general anesthesia (Group C). Patient outcomes, including pain scores (measured on a visual analog scale, VAS), procedure duration, post-operative recovery time, and complications, were assessed.

Results and Discussion: Group A, using local anesthesia with sedation, demonstrated the shortest procedure time (mean 15 minutes) and a significantly lower incidence of post-procedural complications compared to Groups B and C. Pain scores were slightly higher in Group A (mean VAS 3) compared to spinal (mean VAS 2) and general anesthesia (mean VAS 1), but patients reported guicker recovery and fewer post-operative urinary retention issues. General anesthesia was associated with the longest recovery time, while spinal anesthesia showed higher complication rates (e.g., transient urinary retention) than local anesthesia.

Conclusion(s): Local anesthesia with conscious sedation appears to be the most efficient and safe anesthetic option for RE-ZUM in BPH patients, offering shorter recovery times and fewer complications. Further studies with larger sample sizes and longterm follow-up are warranted to validate these findings.

References:

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13AP01-5

Gastroscopy in pediatric patients: which anesthesia or sedation protocol?

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Background and Goal of Study: Gastroscopy is a commonly performed procedure in pediatric patients for diagnostic and therapeutic purposes. Ensuring patient comfort while minimizing complications is essential. The choice of anesthesia or sedation for gastroscopy in children remains a key factor influencing procedural success, safety, and patient experience. This study evaluates the efficacy and safety of different sedation protocols in 75 pediatric patients undergoing gastroscopy.

Materials and Methods: A survey was conducted in 9 hospital centers on 75 pediatric patients (ages 4-12 years) who underwent gastroscopy between 2023 and 2024. Three sedation regimens were assessed: intravenous (IV) midazolam and fentanyl (Group A), IV propofol (Group B), and inhalational sevoflurane (Group C). Primary outcomes included sedation efficacy (measured by the Ramsay Sedation Scale), complication rates (e.g., respiratory or cardiovascular issues), and recovery times. Secondary outcomes involved parental satisfaction and post-procedural discomfort.

Results and Discussion: Group B (IV propofol) showed the most rapid onset of sedation and shortest recovery times (mean 10 minutes). Complication rates were lowest in Group B, with only mild hypoxia observed in four patients, resolved without intervention. Group A (midazolam and fentanyl) had moderate sedation efficacy and longer recovery times, while Group C (sevoflurane) demonstrated similar sedation levels but higher incidences of transient respiratory issues (4/8 patients). Parental satisfaction was highest in Group B due to reduced anxiety and shorter postprocedural recovery.

Conclusion(s): IV propofol offers superior sedation quality with fewer complications and faster recovery in pediatric gastroscopy. It represents the optimal choice for minimizing adverse events and enhancing patient and family satisfaction. Further studies with larger cohorts are needed to corroborate these findings.

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- 1. Lammers, K., et al. (2023). "Sedation protocols in pediatric gastroscopy: A systematic review of safety and efficacy." Pediatric Gastroenterology, Hepatology & Nutrition, 26(4), 355-362.
- 2. Patel, S., et al. (2024). "Comparing intravenous and inhalational sedation in pediatric gastroscopy: A randomized controlled trial." Journal of Pediatric Anesthesia, 34(2), 201-208.

13AP01-6

Outpatient surgery in a patient with chronic inflammatory demyelinating polyneuropathy (CIDP): a case report

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Background: Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) is a rare autoimmune disorder causing motor and sensory deficits. Perioperative management is challenging due to altered responses to neuromuscular blockers, heightened pain sensitivity, and respiratory issues. Outpatient surgery in CIDP patients is rarely reported, making this case clinically relevant.

Case Report: A 62-year-old male with lumbar radiculopathy due to L4-L5 spondylolisthesis and a herniated disc underwent transforaminal lumbar interbody fusion in an outpatient setting. History included diabetes mellitus, hypertension and CIDP, managed with azathioprine, prednisolone, and plasma exchange every three weeks, with the last session one week prior to surgery. Neurological exam revealed strength preserved in all limbs except for grade 4 in left-hand finger abduction, generalized areflexia, and muscle atrophy. Preoperative assessment (ASA III) included normal blood tests, chest X-ray, and ECG.

Anesthesia was conducted with total intravenous anesthesia using propofol and remifentanil, avoiding neuromuscular blockers. After intubation, the patient was positioned prone. Surgery was uneventful. Multimodal analgesia was used, and the patient was transferred to the PACU. Maximum pain score was 4 (Numeric Rating Scale), reduced to 0 at discharge, with no postoperative opioids required. He was discharged in under 24 hours after clinical and neurological stability. At one-week follow-up, he reported symptom improvement, pain control without medication, and no neurological deficits or exacerbations. He remains under neuroloay follow-up.

Discussion: This case demonstrates the feasibility of outpatient surgery with one overnight stay in CIDP patients with stable disease. Patients with CIDP often exhibit heightened pain sensitivity due to neuropathic mechanisms, making multimodal analgesia essential for effective pain control. Avoiding neuromuscular blockers minimized neuromuscular dysfunction risks, while careful airway management and prone positioning enabled safe surgery. Despite elevated baseline risks, including pulmonary complications, the patient experienced rapid recovery and no adverse events.

References: Takekawa D, et al. JA Clinical Reports. 2019;5(1):19 Learning Points: Outpatient surgery in stable CIDP patients is feasible with thorough planning, tailored anesthesia to minimize risks, close neurology collaboration, and follow-up to ensure recovery and monitor outcomes.

Analysis of predictors for airway intervention during sedation in magnetic resonance image; a retrospective study

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Background and Goal of Study: Magnetic resonance imaging (MRI) examinations require patients to remain motionless, often necessitating sedation for those who are claustrophobic or uncooperative. The head coil, essential for enhancing imaging quality, enforces a neutral head position and restricts neck extension, which increases the risk of airway obstruction during sedation. The STOP-Bang questionnaire, originally developed to screen for obstructive sleep apnea (OSA), has been used to predict difficult mask ventilation and intubation in perioperative settings. This study aims to identify predictors for airway intervention, including nasal/oral airway or supraglottic airway insertions.

Materials and Methods: This retrospective study analyzed patients aged 18 years or older who underwent sedation for MRI examinations. Demographic variables, such as age, body mass index (BMI), and neck circumference, American Society of Anesthesiologists (ASA) physical status, and responses to the STOP-Bang questionnaire were extracted from medical records. Binary logistic regression was performed to identify predictors of airway intervention.

Results and Discussion: Between November 2021 and April 2024, 153 eligible patients were analyzed. Of these, 66 were classified as low risk for OSA, 44 as intermediate risk, and 43 as high risk. Airway intervention was required in 102 patients (66.7%). Univariate analysis revealed that BMI, ASA physical status, snoring, risk score, and neck circumference as significant factors for airway intervention. Multivariate analysis further confirmed that higher BMI (p = 0.028, Odds ratio (OR) = 1.152 [1.015-1.308]), ASA class 3 compared to class 2 (p=0.003, OR = 4.717 [1.715-12.987]), and high risk compared to low risk (p = 0.005, OR = 6.730 [1.771-25.581]) or intermediate risk (p < 0.001, OR = 11.236 [3.125-40]) were significant predictors.

These findings align with prior studies on airway obstruction during general anesthesia or conscious sedation. Considering that two-thirds of patients requiring head coils needed airway intervention, particular attention is warranted for high-risk patients.

Conclusion(s): BMI, ASA physical status, and STOP-Bang risk score were significant predictors of airway intervention during sedation for MRI examinations. Recognizing these risk factors can enhance patient safety by enabling proactive preparation and timely intervention to prevent sedation-related airway obstruction during MRI examinations.

13AP01-8

Remimazolam with peripheral nerve blocks as sole sedative agent for ASA 4 joint arthroplasty revision patients

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Background: ASA 4 patients undergoing Emergency surgery. Reduction of dislocation / washout post hip/knee Arthroplasty. Pt not fit for General Anaesthesia due to the need to avoid respiratory depression due to severe COPD/OSA/ Dementia. Pt on anticoagulants and not fit for central Neuraxial blockade.

Anticipated Surgery duration <1 hour. Remimazolam is a benzodiazepine sedative available for procedural sedation in adults in the UK which has rapid onset and rapid offset with minimal respiratory depression is small doses.

Case report: 5 ASA 4 Patients for post knee joint replacement infection washout / hip dislocation reduction. Use of Remimazolam 2. 5 mg i.v as initial bolus on induction with 2.5 mg increments along with Ultra sound guided Fascia illiaca block with 30 ml 0.25 Levobupivacaine. The Modified Observer's Assessment of Alertness and Sedation (MOAA scale) was used to observe patients in recovery. The score was between 2 to 3 for all patients and they were awake in recovery. No adverse effects like hypotension or respiratory depression were observed.

Discussion: Remimazolam is a novel ultrashort acting sedative Benzodiazipine (BZD) with esterase hydrolysis (rather than the usual cytokines) and doesn't cause respiratory depression. Its 'inactive' metabolite (300 x less active than parent compound). Its use in ASA 4 cases with multiple co-morbidity in small doses is safe and gives sedation and hypnosis with amnesia.

References:

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Learning points:

• No remimazolam treatment-emergent adverse events occurred during the evaluation



Remimazolam used was 5 mg

- Mean time to onset of sedation was 3 min and Mean recovery time after end of procedure was 5.0 min
- No flumazenil / Naloxone intervention was required

LBR.0000000000000784. PMID: 34238838.

Comparative evaluation of remimazolam, midazolam, and propofol for sedation in IBD patients undergoing colonoscopy: Discharge readiness, satisfaction, and safety outcomes

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Background and Goal of Study: : Endoscopy plays a crucial role in managing inflammatory bowel disease (IBD). IBD patients often experience heightened pain and discomfort during these procedures compared to the general population. Remimazolam has been recently introduced as a novel benzodiazepine for sedation in procedural endoscopy.

This study aims to compare effectiveness, satisfaction and safety of Remimazolam (R) vs Midazolam (M) or Propofol (P) in IBD patients undergoing colonoscopy.

Materials and Methods: Observational single-center study including consecutive IBD patients undergoing colonoscopy for therapy response monitoring between May and July 2024. Patients divided into three groups based on the type of sedation administered: R group, M group and P group. The primary endpoint was discharge readiness, evaluated using the PADSS (Post Anesthesia Discharge Scoring System) score at 10 and 20 minutes post-procedure (eligibility for discharge if PADSS ≥ 9). Secondary endpoints included: patient satisfaction according to a four levels scale, pain assessed using numeric rating scale (NRS) and the rate of terminal ileum intubation. Sedation-related adverse events were recorded to assess safety.

Results and Discussion: 195 patients enrolled: 95 received R, 52 M, and 51 P. The three groups were comparable in terms of age. IBD duration, BMI, history of abdominal surgery, ongoing use of antipsychotic or opioid therapy, Fentanyl dosage during the procedure, ASA score, presence of perianal disease, and clinical or endoscopic remission. About PADSS at 10 minutes: 14 out of 52 patients (26.9%) in the M group were eligible for discharge, compared to 23 out of 51 in the P group (45.1%) and 65 out of 95 patients (68.42%) in the R group (p < 0.001 R vs M; p 0.006 R vs P). No significant differences in discharge readiness were observed between the three groups at 20 minutes. No differences in terms of patient satisfaction were assessed between the groups. No serious adverse events were reported in any group, and there were no significant differences in mild adverse events among the groups. Terminal ileum intubation was successfully achieved in all patients across all groups.

Conclusion(s): Remimazolam was associated with a significantly higher discharge readiness rate at 10 minutes post-procedure with a safety profile and patient satisfaction comparable to both Midazolam and Propofol.

Reference:

10.1016/j.gie.2018.04.2351, 10.1016/j.dld.2020.10.039

13AP02-2

Establishment and validation of a prediction model for hypoxemia in middle-aged and elderly outpatient patients undergoing painless gastroscopy diagnosis and treatment: a retrospective cohort study

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Background and Goal of Study: Hypoxemia is a very common complication associated in painless gastroscopy diagnosis and treatment services. The number of cases of hypoxemia among middle-aged and elderly patients is increasing. However, tools for predicting hypoxemia in middle-aged and elderly patients are lacking. Machine learning can efficiently perform complex nonlinear data processing, risk prediction, disease diagnosis, and other functions.

In this study, we investigated the risk factors for hypoxemia in middle-aged and elderly outpatients undergoing painless gastroscopy based on machine learning and constructed a risk prediction model

Materials and Methods: In this retrospective study, we included the data on 1,348 outpatients undergoing painless gastroscopy. Five machine learning algorithm models were selected. The 26 characteristic variables selected by BorutaShap were incorporated into five machine learning algorithms. The best models were selected based on the area under the receiver operating characteristic curve. Model feature importance was explained and analyzed using Shapley Additive Explanations.

Results and Discussion: In the final cohort of 984 patients, 11% of patients (108/984) experienced hypoxemia during the painless gastroscopy procedure. The AUROCs of the five models were as follows: Logistic Regression (AUROC = 0.893, 95Cl: 0.881-0.899), SVM (AUROC = 0.855, 95Cl: 0.812-0.884), Random Forest (AUROC = 0.914, 95Cl: 0.889-0.924), XGB (AUROC = 0.902, 95Cl: 0.865-0.919), and LightGBM (AUROC = 0.891, 95Cl: 0.847-0.917). Regarding the explanation of the importance of SHAP features, preoperative variables (baseline SpO2, body mass index, and micrognathia) and intraoperative variables (operating time of gastroscopy, induction dose of etomidate and propofol mixture, append anesthetic, cough, and repeated pharyngeal irritation) significantly contributed to the model.

Conclusion(s): We identified eight potential risk factors related to the occurrence of hypoxemia in middle-aged and elderly patients undergoing painless gastroscopy, based on machine learning feature engineering. Among the five machine learning algorithms, RF exhibited the best predictive performance in the internal test set and had a certain degree of generalization ability in the external validation set. This model was more likely to enhance the accuracy of hypoxemia prediction in middle-aged and elderly patients undergoing painless gastroscopy.

Is dexmedetomidine safe for sedation of a patient with myotonic dystrophy type 1 in an outpatient basis? A case report

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Background: Type 1 myotonic dystrophy (DM1) is a rare muscular dystrophy with multisystemic manifestations that increase susceptibility to some anesthetic drugs.¹ Dexmedetomidine, a highly selective alpha-2 adrenergic agonist, offers sedative, anxiolytic and analgesic properties with a low risk of respiratory depression. Its short duration of action supports outpatient use. However, its cardiovascular adverse effects are still a major concern. As a sympatholytic agent, it can induce significant bradycardia and hypotension, particularly in susceptible patients and during or after the initial bolus.¹

Case Report: A 52-year-old man with DM1 and cognitive impairment was scheduled for outpatient correction of severe ptosis. He had significantly impaired respiratory function, a first-degree atrioventricular block, and a complete left bundle branch block on his electrocardiogram. The surgery was performed under local anesthesia and dexmedetomidine infusion (4 mcg/mL). The initial bolus was set at an intermediate dose (0.7 mcg/kg/h) to minimize cardiac instability and then adjusted to 0.3-0.5 mcg/kg/h guided by bispectral index and hemodynamic effects. The patient maintained spontaneous ventilation and hemodynamic stability throughout the 1-hour procedure. There were no postoperative complications, and he was discharged 4.5 hours later.

Discussion: Patients with DM1 may exhibit sympathetic dysfunction, vagal predominance,² and a tendency for cardiac arrhythmias.³ This patient had cardiac conduction anomalies previously associated with asystole after dexmedetomidine infusion.¹ While his systolic blood pressure decreased by 16% from baseline, no episodes of bradycardia occurred. Only one similar case has been reported, involving a patient with a pacemaker³, which provided additional safety against bradycardia. This is the first case stating the use of dexmedetomidine in a DM1 patient undergoing ambulatory surgery.

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- 1. Lee S. Dexmedetomidine: present and future directions. Korean J Anesthesiol. 2019 Aug;72(4):323-330.
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- 3. Liu AY, Dower A, Nair S. Dexmedetomidine infusion for sedation in a patient with myotonic dystrophy. Anaesth Rep. 2020 Oct 16;8(2):135-137.

Learning points: Dexmedetomidine could be a promising drug for use in this patient population.

13AP02-4

Perioperative factors associated with prolonged time to ambulation for robotic prostatectomy in an Ambulatory Surgery Center (ASC)

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Background and Goal of Study: Enhanced Recovery After Surgery is a standardized perioperative protocol that reduces physical and metabolic stressors during surgery. Radical proctectomies performed with enhanced recovery protocol are associated with better post-operative outcomes including earlier time to ambulation.

The objective of this study was to identify factors associated with delayed ambulation among patients undergoing radical prostatectomy in an ambulatory surgery setting (23 hr stay).

Materials and Methods: Patients who underwent robotic-assisted prostatectomy at Memorial Sloan Kettering Cancer Center's Josie Robertson Surgery Center between January 11, 2016, and December 27, 2022, were eligible for inclusion. Predictors of interest were identified from literature review and included age, American Society of Anesthesia physical status (1/2 vs 3/4), operative time, amount of intravenous fluids, estimated blood loss, intraoperative morphine equivalents, use of a block and post-operative nausea and vomiting score via Apfel scoring criteria, and real-time locating system (RTLS) to measure ambulation.

Results and Discussion: The final cohort consisted of 3677 patients undergoing prostatectomy. Median time to ambulation was 5.1 hours (IQR 4.2, 6.3). 141 (3.8%) patients had an Apfel post-operative nausea score of 3. When assessing covariates, we found that only Apfel score was significantly associated with delayed ambulation; having a score of 3 was associated with more than double the odds of next-day ambulation vs those with scores \leq 2 (OR 2.15, 95% CI 1.25, 3.60, p=0.006).

Conclusion(s): Our study showed an association between preoperative Apfel and delayed ambulation indicating that PONV control is important even among men undergoing radical prostatectomy. Postoperative nausea and vomiting (PONV) is a significant factor associated with delayed ambulation after robotic-assisted prostatectomy. Strategies to minimize PONV, such as prophylactic antiemetic therapy, may help improve postoperative recovery and reduce the incidence of delayed ambulation.

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Efficacy of THRIVE and target controlled infusions for sedation in SpyGlass cholangioscopy - a retrospective case series analysis

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Background: SpyGlass cholangioscopy is an advanced tool for diagnosing and treating complex biliopancreatic diseases. It allows direct visualization, biopsy sampling, and electrohydraulic or laser lithotripsy. While minimally invasive, the procedure causes significant discomfort, necessitating deep sedation. Target-Controlled Infusion (TCI) of propofol, coupled with Transnasal Humidified Rapid Insufflation and Ventilatory Exchange (THRIVE), provides stable sedation with spontaneous ventilation, hemodynamic stability, and rapid recovery.

Case Report: Four patients underwent SpyGlass cholangioscopy under deep sedation using TCI propofol with THRIVE. Propofol was titrated using the Schneider model to achieve a Bispectral Index (BIS) target of 40-50. Oxygen flow via THRIVE started at 10 L/min and increased to 50 L/min during scope insertion. Fentanyl boluses (1 mcg/kg) were administered intermittently for pain. Hemodynamics, BIS, and propofol concentrations were continuously monitored. After the procedure, propofol was stopped, and patients were observed until fully awake.

Case	Gender	Age (yrs)	Weight (kg)	Propofol (mL)	Procedure Time (min)	Max Propofol (mcg/mL)	Recovery Time (min)	Complica- tions
1	F	48	49	110	140	5.65	25	Nil
2	F	34	55	45	60	3.96	10	Nausea
3	M	25	50	45	40	6.30	15	Vomiting
4	M	72	50	50	70	4.01	20	Nausea

Discussion: THRIVE provides excellent oxygenation and allows spontaneous breathing during shared airway procedures. Studies confirm its efficacy in reducing hypoxia and procedural interruptions. TCI propofol offers precise sedation control, as shown by Schneider model-guided dosing and BIS monitoring. Despite risks of gastric insufflation with THRIVE, no distension was noted, and prophylactic antiemetics mitigated post-procedure symptoms. Combining THRIVE and TCI propofol ensures optimal sedation, minimal airway intervention, and rapid recovery during SpyGlass cholangioscopy.

References:

The SpyGlass direct visualisation system for diagnostic & therapeutic procedures during endoscopy of the biliary system.2015 www.nice.org.uk/guidance/mib21 Motiaa Y,et al. Anesthesia for endoscopic retrograde cholangiopancreatography: target-controlled infusion versus st&ard volatile anesthesia. Ann Gastroenterol. 2016 doi:10.20524/aog.2016.0071

Learning points: TCI with THRIVE with adequate monitoring is an optimal choice for Spyglass cholangioscopy allowing short recovery time & less peri-operative complications compared to standard anaesthetic techniques.

13AP02-7

Efficacy and safety of cipepofol versus remimazolam combined with low-dose sufentanil in painless gastroscopy: a prospective, single-center, single-blind, randomized controlled trial

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Background and Goal of Study: Cipepofol is an innovative drug developed independently in China, known for its effective anesthetic and sedative properties. Remimazolam is believed to provide adequate sedation for gastrointestinal endoscopy. However, there are no studies comparing the effectiveness and safety of cipepofol with remimazolam for the diagnosis and treatment of painless gastroscopy in adults.

This study was intended to compare the effectiveness and safety of remimazolam and cipepofol in adult outpatients undergoing painless gastroscopy.

Materials and Methods: This study included a total of 194 patients, who were allocated into the remimazolam group and the cipepofol group in a 1:1 ratio. The remimazolam group received $0.3 \text{ mg/kg remimazolam} + 0.1 \,\mu\text{g/kg sufentanil}$, while the cipepofol group received 0.4 mg/kg cipepofol + 0.1 µg/kg sufentanil. The primary outcome measure was the sedation success rate, while adverse events were recorded to evaluate safety. Continuous variables are presented as N, Mean ± SD, M (Q1, Q3), Min, Max, and differences between groups are analyzed using the T test. Categorical variables are reported as N (%), with differences between groups assessed using the Chi-square test.

Results and Discussion: The sedation success rate was 99% in the remimazolam group and 100% in the cipepofol group. The success rate for the first dose of sedation was 91.75% for cipepofol, compared to 64.95% for the remimazolam group.

The incidence of apnea (1.03% vs. 6.19%; P = 0.124), respiratory depression (6.19% vs. 5.15%; P = 1.000), hypoxemia (8.25% vs. 7.22%; P = 1.000), hypotension (4.12% vs. 2.06%; P = 0.678), bradycardia (4.12% vs. 2.06%; P = 1.000), dreams (12.37% vs. 20.62%; P = 0.176), and injection pain (5.15% vs. 1.03%; P = 0.213) showed no statistical significance.

The incidence of body movements was higher in the remimazolam group (31.96% vs. 14.43%; P = 0.006), as was the incidence of choking (25.77% vs. 13.40%; P = 0.047) and hiccups (13.40% vs. 2.06%; P = 0.007).

Both remimazolam and cipepofol exhibit promising applications in the diagnosis and treatment of painless gastroscopy in adults, with cipepofol demonstrating superior safety.

Conclusion(s): Both 0.3 mg/kg remimazolam and 0.4 mg/kg cipepofol combined with 0.1 µg/kg sufentanil exhibit effective sedative properties. Cipepofol has lower incidence of adverse events, especially body movements, choking and hiccups, as compared to remimazolam.

Anaesthetic risk factors of delayed discharge after appendectomy performed in ambulatory surgery

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Background and Goal of Study: Acute appendicitis is the first emergency in digestive surgery. Its treatment can be performed in an outpatient surgery unit. It requires optimized management from both surgical and anaesthetic perspectives. The main objective of this study is to identify the anaesthetic factors that may prolong the length of stay after an appendectomy performed in ambulatory unit.

Materials and Methods: This is a five years retrospective monocentric study conducted at Saint Antoine Hospital in Paris. All adult patients who underwent appendectomy for acute appendicitis in the ambulatory unit were included. Demographic data, ASA score, and administered anaesthetic products were studied, as well as the operative times and durations in the post-anaesthesia care unit. The primary endpoint was the discharge time, defined as the time between the end of surgery and discharge. Results and Discussion: Six hundred eighty-two (682) patients were included. The mean time before discharge was 1,71 hours ± 0,027. Factors statistically associated with a prolonged discharge time were the non-use of ketamine (p=0,041), desflurane use as maintenance of anaesthesia (p=0.045) and the perioperative dose of sufentanil (p=0,010). Thirty-one patients (4,54%) experi-

Conclusion(s): This study showed that anaesthetic practices influence the time to discharge after appendectomy performed in an ambulatory unit.

enced unplanned hospitalization postoperatively.

13AP02-9

Evaluation of the effectiveness of melatonin for recording ABR in children (Experience from a third-world country)

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Background and Goal of Study: In the pediatric population, auditory brainstem response (ABR) testing can be challenging due to the lack of child cooperation. The Goal of study is to evaluate the efficacy of oral melatonin in achieving sleep necessary for conducting threshold auditory brainstem response (ABR) tests in children suspected of having hearing impairments.

Materials and Methods: It's a prospective study. All children over one year of age suspected of hearing impairment.

Outcomes are Percentage of successful ABR examinations, percentage of children achieving sleep with melatonin, and Time required to complete a full ABR examination after the melatonin dose. ABR tests were conducted in a day-hospital setting in ENT. in a single-occupancy room optimized for sleep. After parental consent, 5 mg (or 10 mg for children over 6 years) of melatonin is administered orally, dissolved in 10 mL of water. A dedicated data collection form is used to record parameters from patient files comply with the principles of the Declaration of Helsinki, Study submitted to the ethics committee. Data were analyzed using EX-CFL and SPSS software.

Results and discussion: 18 children aged 2 to 14 years have been included since September 2024.36 ears were tested using threshold ABR under melatonin: in 4 children, both ears were fully explored, resulting in 8 completed tests (22.2% of children): in 6 children, only one ear was explored, leading to 6 completed tests (33.3%); and in 8 children, the test could not be performed (44.4% failure rate).

One child achieved good-quality sleep (5.5%), 10 had brief sleep but remained calm during the test (55.5% of children), and 7 children never reached sleep (38.9%). The average time to achieve effective sleep after melatonin administration was 42 minutes, with an average sleep duration of 24 minutes and an average test duration of 55 minutes after melatonin administration. Therefore, an average of 97 minutes was required to complete a full test.

Conclusion(s): The use of melatonin has indeed enabled us to test at least 55.5% of children on at least one ear. However, the failure rate remains significant at 44.4%. Consequently, we believe that our protocol is not effective and requires adjustments. Additionally, our sample size is limited, which restricts the scope of our study. That said, the study is ongoing as we await more relevant results.

13AP02-11

Trends in anaesthesia for phacoemulsification combined with minimal invasive glaucoma surgery: a case report

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Background: Glaucoma is emerging as one of the main causes of irreversible blindness worldwide. New minimally invasive surgical technologies like iStent® have emerged with satisfactory results 1 and the goals of anesthetic care during micro-invasive glaucoma surgeries are minimization of increased risk of damage to the optic nerve during local anesthetic injection.

Case Report: A 60 years-old male with chronic bilateral glaucoma, underwent phacoemulsification combined with minimal invasive glaucoma surgery with implantation of intraocular lens (IOL) plus angular drainage device for glaucoma iStent®, performed using a minimally invasive technique. He had already undergone cataract and glaucoma surgery (trabeculectomy) with significant visual loss in the other eye, 20/80 and tubular visual field. Eye showed significant worsening of vision due to nuclear and posterior subcapsular cataract. Moderate glaucoma damage with also moderate visual field damage, ocular pressure of 17 mmHg with daily use of latanoprost.

Since it was the better eye, with moderate damage, performed peribulbar block (Ropivacaine 1%- 4mL) avoiding increases in intraocular pressure during anesthesia and admnistered dexmedetomidine for collaborative sedation². Facectomy surgery and IOL implantation were performed without complications. The patient's head was repositioned at an angle of approximately 45 degrees for placement in the nasal trabecular meshwork through temporal access. Surgical procedure lasted 20 minutes, and patient was discharged consciously at same day, with ocular pressure already at 14 mmHg in the first few days.

Discussion: Anesthetic care during glaucoma micro-invasive ambulatorial anesthesia involves risk of transitory increase in intraocular pressure and damage to the optic nerve during local anesthetic injection. The goal of sedation must be minimize anxiety, and dexmedetomidine is an excellent option since provides an awake and cooperative sedation.

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Learning points: Monitored anesthesia care, eye ambulatory anesthesia, glaucoma new devices anesthesia.

13AP02-12

Non-operation room anesthesia during polypectomy in colonoscopy for a patient with pattern of Wolff-Parkinson White

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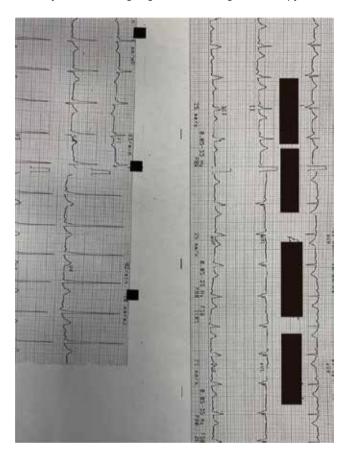
Background: Wolff–Parkinson–White (WPW) syndrome remains still one of the most difficult cardiac arrhythmia to treat in NORA practice. The incidence of the WPW pattern on the electrocardiogram is 0.13% to 0.25% while of WPW syndrome is 0.9-3% of the general population. The risk of sudden death from malignant arrhythmia is estimated at 0.4% /year in patients with WPW syndrome. While colonoscopy is safe, it still carries the risks for cardiac complications.

Case Report: We report a 44 years old male planned for colonoscopy after Fecal occult blood test >25 ng/ml. He was diagnosed with WPW syndrome 9 years ago. A preoperative evaluation showed 12-lead ECG (RS with FC nearly 60bpm, a shortened PR interval and the presence of delta wave) and Rhythm Holter: RS diffused in accessory way (WPW) 40 ESA not significant, without ventricle arrhythmia, maximal frequency 106/min, on average 62/min, minimal 40/min, without disorder of AV diffusing. He was treated in that period with atenolol 50mg x 2 and denied ablation. After i/v cannulation and non-invasive monitoring, oxygenation with 2L was started.

We used dexmedetomidine 3 mcg/kg + ketamine 2 mg/kg i/v for NORA. Adenosine, procainamide, and amiodarone were kept on standby. The procedure lasted 30 minutes and the patient had an early recovery.

Discussion: The perioperative goal of anesthesia is a moderate balance between sympathetic stimulation and vagal tone. Anesthetic medications tent to alter the physiology of atrioventricular (AV) conduction. The recent study have shown Propofol administration is related to arrhythmias that is why we avoided it.

Our case aims to highlight that proper medical knowledge combined with appropriate precautions can avoid sympathetic stimulation. They are the key to a successful outcome in patients with WPW syndrome undergoing sedation during colonoscopy.



References:

Qiang LIU1, Ai-ling KONG1, §, Rong CHEN1, Propofol and arrhythmias: two sides of the coin, Acta Pharmacologica Sinica (2011) 32: 817–823.

Learning points: It is essential to highlight that proper medical knowledge coupled with appropriate precautions can avoid sympathetic stimulation.

The Obstetric Patient

21AP01-1

Anesthesia management in a 36-year-old pregnant woman with a pituitary macroadenoma: a multidisciplinary approach for endoscopic endonasal resection at 18 weeks gestation

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Background: Pituitary adenomas (PA) during pregnancy present a unique challenge due to potential complications. Management is complex and multidisciplinary. This case is noteworthy due to the rarity of performing non-obstetric surgery, specifically a pituitary resection.

Case Report: 36-year-old, 18 weeks pregnant ASA II woman, with personal history of hypothyroidism and PA under medical treatment. After cabergoline discontinuation in the beginning of pregnancy she developed visual disturbances. CT scan confirmed a PA extending into the right cavernous sinus and compressing the optic chiasm. Given tumor's progression and symptoms, a decision was made for surgical endonasal resection. The patient was managed by a multidisciplinary team, ensuring both maternal and fetal safety. ASA standard monitoring plus invasive blood pressure was applied. We decided for total intravenous anesthesia (TIVA) with dexmedetomidine, remifentanil, propofol and rocuronium with tracheal intubation. Surgery was uneventful. She was extubated at the end of the procedure. Fetal wellbeing was confirmed through ultrasound. She was transferred to the ICU for further observation and care.

Discussion: PA in pregnancy are rare, particularly those with significant growth or extension to structures like the cavernous sinus. The challenges in this case arose from the need for surgical intervention in pregnancy, which carries the risks of preterm labor, anesthesia complications, and potential fetal harm, underscoring the importance of a multidisciplinary approach. Management required meticulous planning. TIVA was chosen to avoid the risks associated with volatile anesthetics. Dexmedetomidine, although rarely used in pregnancy, provided hemodynamic stability. Fetal monitoring was conducted with careful attention to maternal blood pressure, fluid balance, and avoidance of uterine artery vasoconstriction. Anesthesiologists must be prepared for the unique physiological changes and increased risks during these procedures.

References:

Jia XY, et al. Surgical management of pituitary adenoma during pregnancy. World J Clin Cases 2023; 11(12): 2694-2707

Learning Points: Anesthesia management during non-obstetric surgery in pregnancy requires tailored techniques to minimize risks to both the mother and fetus. TIVA is a safe approach. The importance of preoperative assessment, continuous fetal monitoring, and individualized anesthesia protocols is critical in ensuring a successful outcome.

21AP01-2

Beyond the myths about labour analgesia: level of maternal knowledge in a Portuguese hospital

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Background and Goal of Study: Labour analgesia plays a critical role in improving childbirth experience. However, misconceptions and limited knowledge among pregnant women regarding labour analgesia often lead to unnecessary anxiety and reluctance toward its use.

Our goal was to analyse the prevalence of these myths and evaluate maternal knowledge about labour analgesia.

Materials and Methods: This cross-sectional study was conducted at the Gynecology and Obstetrics Emergency Department of ULS São João from July to October 2023. A questionnaire addressing sources of information, knowledge levels and common misconceptions about labour analgesia was administered to postpartum women prior to discharge.

Knowledge was scored based on correct answers, with participants classified into high (>6) or low (<3) knowledge levels, defined as mean ±1 standard deviation.

Univariate analysis was performed using Chi-square or Fisher's exact tests with p<0.05 considered statistically significant.

Results and Discussion: A total of 172 postpartum women were included, with a mean age of 31±6 years. Of these, 54.7% were primiparous, 86.6% had a gestational age of 37-40 weeks and 64.5% had an eutocic delivery. 59.6% of the participants reported receiving information about labour analgesia before pregnancy and 32.2% during pregnancy, mainly from health professionals (73.7%) or childbirth preparation classes (43.6%). None of the participants reported a complete lack of knowledge about labour analgesia.

Participants correctly identified as false the statements "Epidural analgesia prevents labour participation" (94.0%) and "Epidural analgesia can harm the baby" (80.2%). However, more than half lacked knowledge or held misconceptions about spinal complications. Only 20 (11.6%) scored >6 (high knowledge), while 110 (64.0%) scored <3 (low knowledge). High knowledge levels were significantly associated with receiving information from health professionals (p=0.01).

Among the participants who reported not receiving labour analgesia (n=3), all had moderate knowledge but held specific misconceptions (e.g., "Epidural analgesia can harm the baby" (p=0.005) vs participants with labour analgesia).

Conclusion(s): This study highlights significant gaps in maternal knowledge about labour analgesia, particularly regarding potential complications and misconceptions. Information provided by health professionals is strongly associated with better knowledge, underlining the importance of antenatal education and counseling.

21AP01-3 Labour Regional Analgesia QIP

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Background and Goal of Study: Standards for the provision of labour analgesia have been defined by the RCoA(Royal college of Anaesthetist) and include:

More than 85% blocks successful, re-sites during labour less than 15%, accidental dura puncture rate less than 1%, satisfaction at follow-up greater than 98% and adequate analgesia at 45 minutes after start of procedure over 88%.

Aims: Collect data over a 3 month period.

Compare our data to the standards and indicators set out in 'Raising the Standards: RCoA Quality Improvement Compendium'.

Materials and Methods: Data was collected over 2 separate audits which were performed between 3rd February - 5th May 2022 and the second audit in 16th April 2023 - 16th July 2023. This re audit gives the details of data from the audit in 2023 and compares it with the data in 2022.

The data was collected from the recordkeeping in the labour ward. The characteristics of the data were as follows:

- · Descriptive data: Date, time, grade of anaesthetist, technique of epidural, complications in follow up, satisfactory analgesia at 45mins or not.
- Incidence of re-siting epidural, accidental dura puncture(ADP), post dural puncture headache(PDPH) was recorded.

Results and Discussion:

- 1) Total 223 epidurals documented, incidence of ADP was 1/223 (0.44%), 1 patient developed **PDPH** and got epidural blood patch. 2) Technique of epidural: In 2022, some anaesthetist were using loss of resistance to air(LORA), while in 2023, all were doing Loss of resistance to saline(LORS).
- 3) The ADP rate in the first audit in 2022 was 3.2%, which decreased to 0.44% in 2023. The reduced incidence of ADP may be due to practicing LORS rather than LORA. Additionally, practicing on mannequins to perform epidural contributed to the decreased ADP rate.
- 4) How did our practice measure up as compared to the 'RCOA standard':
- More than 85% blocks successful. (our rate 93.7%)
- Re-sites during labour less than 15%. (our rate 5.4%)
- Accidental dural puncture rate less than 1% (our rate 0.44%)
- · Satisfaction at follow-up greater than 98%. (93.7%)
- 5) The number of epidurals done in the night are as much in number as in daytime with no difference in complication rate.

Conclusion:

- 1) LORS technique leads to less incidence of ADP.
- 2) Using mannequin to practice epidurals can lead to decreased
- 3) The complication rate is the same in night as compared to the
- 4) Better follow up to quantify satisfactory analgesia

21AP01-4

Navigating the adrenal storm: C-section in a pregnant patient with pheochromocytoma

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Background: Pheochromocytoma during pregnancy is a rare, lifethreatening condition requiring multidisciplinary management due to the risk of hypertensive crisis and adverse outcomes. Preoperative optimisation and tailored intraoperative care are essential for improving prognosis.

Case Report: We describe a 41-year-old female, ASA III, G3P1, diagnosed with pheochromocytoma during the third trimester of pregnancy. Prior to an elective cesarean section, an alpha-adrenergic blockade was performed with administration of phenoxybenzamine 10mg during 10 days, under continuous maternal-fetal monitoring. Intraoperative management included ASA-standard and invasive arterial pressure monitoring. Epidural anesthesia with 15mL of ropivacaine 7,5mg/mL was administered without significant complications.

Two transient hypertensive episodes occurred intraoperatively, resolving spontaneously. The neonate had Apgar scores of 9/10/10 and was transferred to level 2 neonatal care for closer observation. The mother was monitored postoperatively in a level 3 intensive care unit, maintaining alpha-blockade and blood pressure surveillance. She was discharged on postoperative day 4, hemodynamically stable, and later underwent laparoscopic resection of the pheochromocytoma without anesthetic or surgical complications.

Discussion: This case highlights the importance of preoperative alpha-adrenergic blockade in controlling hemodynamics and mitigating intraoperative risks. Epidural anesthesia, with invasive arterial monitoring, allowed for stable intraoperative conditions. Postoperative ICU care ensured early identification and management of potential complications, and prompt surgical resection minimized long-term risks.

References:

Clifton-Bligh RJ. The diagnosis and management of pheochromocytoma and paraganglioma during pregnancy. Rev Endocr Metab Disord. 2023 Feb. doi: 10.1007/s11154-022-09773-2.

Learning points: A multidisciplinary approach is critical in managing pheochromocytoma during pregnancy and preoperative alpha-adrenergic blockade is essential for reducing perioperative maternal and fetal risks. Epidural anesthesia is effective in ensuring hemodynamic stability during cesarean section; nonetheless postoperative ICU monitoring is crucial for maternal safety. Definitive pheochromocytoma resection should follow maternal stabilization.

21AP01-5 Preoperative fasting in obstetrics: a comprehensive review

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Background and Goal of Study: Historically, preoperative fasting guidelines were shaped by expert opinion rather than evidence. These guidelines evolved from antiquated practices that encouraged prolonged fasting driven by concerns over aspiration intraoperatively and postoperative vomiting. Modern recommendations in obstetrics now support the intake of clear fluids up to two hours before elective anaesthesia, however this practice is seldom seen. This practice of unnecessarily prolonged preoperative fasting for liquids has negative effects on the perioperative experience of the obstetric patient. It can also compromise intraoperative safety through effects such as hypovolaemia, poor glucose control, and increased stress response. It is also responsible for issues with breastfeeding postoperatively.

The objective of this literature review is to investigate the recommended duration of liquid fasting before caesarean section, observe type of liquid that can be ingested prior to caesarean section, and the maternal and neonatal outcomes following reduced preoperative fasting.

Materials and Methods: This is a literature review, carried out as an adjunct to the literature review of clinical evidence by the ESAIC Task Force on Perioperative Fasting in Adults (in print). A systematic literature search was conducted between 1st January 2010 to 6th January 2023. Bibliographic databases were used, including MEDLINE (OVID), Embase (OVID), CINAHL, Web of Science, the Cochrane Database of Systematic Reviews (CDSR), and the Cochrane Central Register of Controlled Trials (CENTRAL).

Eligible manuscripts were original studies published in English between 1st January 2010 and 6th January 2023 reporting on safety, physiological effects, and patient experience-related effects of preoperative fasting in pregnancy women undergoing caesarean section.

Results and Discussion: A total of 12312 records were retrieved. of which 11 RCTs met the inclusion criteria. Four distinct interventions were identified: administration of carbohydrate drinks, water, chewing gum, and no intervention (control groups). The studies reported on four key outcomes: prevalence of regurgitation, time to first breastfeeding, glucose control, and maternal well-being. Conclusion(s): Shorter preoperative fasting times have no effect on regurgitation prevalence. This also reduces time to first breastfeed, improves glucose control, and maternal well-being.

21AP01-6

Maternal considerations in postoperative fasting: a comprehensive review

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Background and Goal of Study: International guidelines on the resumption of postoperative intake of liquids and solids remain scarce. Obstetric patients recovering from cesarian section are subjected to unnecessarily prolonged postoperative fasting times, resulting in increased postoperative maternal and neonatal morbidity. Reduced length of postoperative fasting has been shown to enhance postoperative recovery, improve rehabilitation, and alleviate the psychological burden of major surgery in such patients. These benefits may result in decreased length of hospital stay, which in turn may benefit healthcare sustainability. Given these potential benefits, this literature review aimed to examine and synthesize the current literature on this topic.

Materials and Methods: This is a literature review, carried out as an adjunct to the literature review of clinical evidence by the ESAIC Task Force on Perioperative Fasting in Adults (in print). A systematic literature search was conducted between 1st January 2010 to 6th January 2023. Bibliographic databases were used, including MEDLINE (OVID), Embase (OVID), CINAHL. Web of Science, the Cochrane Database of Systematic Reviews (CDSR) and the Cochrane Central Register of Controlled Trials (CENTRAL).

Eligible manuscripts were original studies published in English between 1st January 2010 and 6th January 2023 describing the use of chewing gym, post-operative fasting duration, and recovery in obstetric patients following caesarean section.

Results and Discussion: A total of 12312 records were retrieved. of which 12 randomised controlled trials met the inclusion criteria. Four distinct interventions were identified: administration of chewing gum, clear fluids, coffee, and no intervention (control). The studies reported on 4 distinct outcomes, including resumption of oral intake, bowel recovery, length of hospital stay, and maternal satisfaction.

Conclusion(s): Shorter postoperative fasting and chewing gum use enhance bowel recovery, improve oral intake tolerance, reduce hospital stay, and boost maternal satisfaction.

Perioperative management of giant liver haemangioma elective resection in a pregnant woman: a case report

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Background: Non-obstetric surgeries during pregnancy require specialized anaesthetic management. Regional anaesthesia is preferred to minimize foetal drug exposure and optimize maternal haemodynamic, but certain surgeries must be performed under general anaesthesia, with more maternal-foetal risks. Unoperated giant haemangiomas can lead to obstructive symptoms, spontaneous rupture and excessive bleeding¹.

Case Report: We present a 29-years-old pregnant woman (19 weeks), without comorbidities, scheduled for elective laparoscopic resection of a giant hepatic haemangioma (85mm x 48mm) detected during the first trimester through abdominal mass palpation. A multidisciplinary team (gynaecology, anaesthesiology, surgery, hepatology, interventional radiology) designed an action plan consensus. Given the high risk of tumour growth and haemorrhage during pregnancy, surgical intervention was considered to be indicated despite the risk of foetal loss. A general anaesthesia with intradural morphine under invasive blood pressure monitoring, ECG and oxygen saturation was performed. No intraoperative foetus monitoring was done due to technical limitations and the foetus age. A pedunculated haemangioma was resected with minimal hepatic transection. The patient remained haemodynamically stable during the procedure and was extubated in the OR. No transfusion was required. Discharge took place after 5 days without complications.

At 39th weeks of pregnancy, an elective c-section was performed due to maternal risk factors, which proceeded without complications

Discussion: Nowadays there are only 11 similar cases published in the literature and there is still no international guideline about the best management of haemangiomas in pregnancy. Multidisciplinary preoperative evaluation is necessary in pregnant women. The very high risk of tumour rupture due to an increased intraabdominal pressure associated to haemangiomas' rapid growth is crucial in decision-making. Surgical intervention should be mandatory when risk of tumour rupture, bleeding or worsening symptoms are present.

Learning Points: Careful anaesthetic planning and close multidisciplinary coordination between specialists are essential to ensure the safety of mother and child in the management of complex cases like liver haemangioma resection during pregnancy.

References:

1. Ward H, Hosseini O; et al. Ruptured Hepatic Hemangioma in the Third Trimester of Pregnancy: A Rare Case Report. Cureus. 2022 May.

21AP01-9

Lumbar extradural hematoma after labor analgesia in an anticoagulated patient, followed by a pulmonary embolism

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Background: Pregnancy and puerperium increase the risk of venous thromboembolic disease (VTD), with systemic anticoagulation being the primary prophylactic or treatment option¹.

Anticoagulation raises the risk of spinal hematoma (SH) after a central neuraxial block (CNB), with an incidence of 1:200000 in obstetric patients².

We report a case of a large extradural SH after labor analgesia in an anticoagulated patient, complicated by a pulmonary emholism

Case Report: A 38-year-old parturient, G4P3, 36w+4d twin gestation, requested labor analgesia. History of obesity (BMI 38), venous insufficiency and deep venous thrombosis of left internal saphenous vein (SV) in the first trimester, anticoagulated with enoxaparin 80mg 2x/day. Normal routine laboratory evaluation. Epidural analgesia was performed at L3-L4, non-traumatic technique, >24h after the last enoxaparin administration. Anticoagulation resumed 6h post catheter removal. Discharged at D4, without complications.

One week postpartum, presented severe lower back pain radiating to the right leg and paresthesia, without weakness. MRI revealed a large extradural SH at L2-L4. Admitted for conservative treatment of SH, anticoagulation suspended. Improvement was noted until D4, when a superficial venous thrombosis of the right anterior accessory SV occurred. Enoxaparin was not resumed due to SH. Two days later she had a massive pulmonary embolism with cardio-respiratory arrest - 45min of advanced life support were performed with return of spontaneous circulation 15min after thrombolysis with alteplase 100mg. Admitted to ICU.

The patient developed hemorrhagic complications after thrombolysis including an upper airway hematoma, requiring intubation. Due to the high thrombotic risk and contraindication for anticoagulation an inferior vena cava (IVC) filter was placed; later, anticoagulation was gradually started and the filter removed. Discharged a month after admission, without neurological deficits. Complaints of generalized weakness, fatigue, throat discomfort, dysphonic voice and stridor at follow-up.

Discussion: SH can occur even with an appropriate timing of enoxaparin suspension. Stopping the anticoagulation can lead to a major thrombotic complication, showing the need to balance the benefits and risks of anticoagulation and its suspension.

Learning points: Pregnancy and puerperium are VTD risk factors. Anticoagulation increases SH risk after CNB. IVC filters are valuable options in complex cases.

Peripartum management of a pregnant woman with uncorrected coarctation of the aorta: a case report

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Background: Congenital coarctation of the aorta (CoA) is usually treated in childhood, with rare cases persisting into adulthood. Untreated CoA can cause severe complications, and pregnancyrelated risks, though rare, may be life-threatening. This report details the perioperative management of a C-section in a pregnant woman with untreated CoA.

Case Report: A 29-year-old pregnant woman with uncorrected CoA had systemic hypertension and exaggerated hypertensive response to exertion, without other severity markers. Additional anomalies included a bicuspid aortic valve and residual patent ductus arteriosus. Imaging showed normal cardiac function, and stress testing confirmed normal functional capacity.

The patient was admitted at 33 weeks for fetal monitoring, with a planned cesarean section. Due to the onset of labor during hospitalization, an urgent cesarean section was performed.

Standard ASA monitoring and invasive arterial blood pressure were used. Epidural anesthesia was administered at L3-L4 interspace in a seated position, without complications. Fractionated boluses of ropivacaine were delivered to minimize hemodynamic lability. The initial bolus consisted of 6 mL of 0.75% ropivacaine combined with 10µg of sufentanil, followed by three additional boluses of ropivacaine, totaling 14mL over 20 minutes. A sensory block up to the T6 level was achieved, with no further local anesthetic required during surgery.

About 20 minutes after epidural onset, mean arterial pressure dropped to 60 mmHg, requiring three 10 µg norepinephrine boluses to resolve. No other complications occurred during surgery. Postoperative analgesia was managed with the epidural catheter, supplemented by 1g paracetamol and 30mg ketorolac. The patient was discharged on postoperative day three without complications.

Discussion: Coarctation of the aorta in pregnancy poses unique challenges, requiring tailored anesthetic and obstetric care. Epidural anesthesia was used to ensure hemodynamic stability, minimize labor stress, and reduce hypertensive crisis risk. Fractionated ropivacaine allowed gradual sensory blockade, avoiding abrupt hemodynamic changes. Transient hypotension was promptly managed with norepinephrine boluses, ensuring maternal and fetal stability.

Reference:

Ramlakhan KP, Tobler D, Greutmann M, et al. Pregnancy outcomes in women with aortic coarctation. Heart. doi:10.1136/ heartinl-2020-317513.

Learning Points: Anesthetic management of a pregnant woman with CoA.

21AP01-11

Management of epidural analgesia in a pregnant patient with suspected local anesthetic allergy

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Background: Allergic reactions to local anesthetics (LAs) in dental procedures are reported in approximately 1% of cases. However, true immediate hypersensitivity reactions to LAs are exceedingly uncommon, with diagnostic tests frequently vielding negative results for suspected cases.

This case highlights the challenges of managing labor analgesia in a patient with a reported but undocumented allergy to LAs.

Case Report: A 30-year-old primigravida presented at full term for spontaneous labor. During pre-anesthetic evaluation, she reported a severe allergic reaction following a dental procedure involving an LA but could not specify the drug or provide supporting documentation. Due to these concerns, a decision was made to proceed with epidural analgesia using fentanyl (10 mcg/ mL), delivered as an initial 10 mL bolus followed by a continuous infusion of 5-7 mL/h. Pain relief was initially effective, reducing her Numeric Rating Scale (NRS) score from 8 to 3. However, after oxytocin infusion initiation, pain escalated, reaching 10 on the NRS. To manage this, on-demand boluses of 5 mL meperidine (5 mg/mL) were administered at a minimum interval of 30 minutes. Labor proceeded uneventfully, but the patient's satisfaction with pain management was partial, rated at 4/10 on a Likert scale. The postpartum period was uneventful, and the patient was discharged after 48 hours.

Discussion: This case underscores the importance of early referral to anesthesiology and allergology consultation for patients with suspected LA allergies, especially when no prior testing or documentation exists. A tailored approach to labor analgesia, incorporating non-LA options, is critical in such scenarios. Although fentanyl-based epidural analgesia provided initial pain relief, the escalation of pain during labor highlights the limitations of this approach.

Learning points: Effective communication and early multidisciplinary involvement are key in managing labor analgesia in patients with suspected LA allergies. This case emphasizes the need for preemptive allergology evaluation and the development of individualized pain management strategies to optimize outcomes and patient satisfaction.

Perioperative anesthetic management for a scheduled cesarean section in a patient with Stiff Person syndrome (SPS) and positive anti-GAD antibodies

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Background: Stiff Person Syndrome (SPS) is a rare autoimmune neurological disorder characterized by muscle rigidity and tonic spasms, particularly in the abdominal and lumbar regions, which is triggered by stress, cold, or auditory and tactile stimuli. Patients with SPS can present significant challenges during surgical procedures due to the risk of triggering crises.

This report describes the anesthetic management of a pregnant patient with SPS and positive anti-GAD antibodies undergoing a scheduled cesarean section (C-section).

Case Report: A 25-year-old pregnant woman at 36 weeks of gestation, allergic to Propofol, was diagnosed with SPS. Her usual treatment included diazepam 10 mg/12 hours, pregabalin 150 mg/24 hours, baclofen 10 mg/12 hours, and rituximab (discontinued at the start of pregnancy).

A scheduled C-section was chosen due to the risk of complications with vaginal delivery. The anesthetic management involved spinal anesthesia with 0.5% bupivacaine 11 mg and fentanyl 10 mcg. The surgical team was prepared to minimize the procedure time. The patient was monitored with ECG, SpO2, and NIBP. A warming blanket was used to prevent hypothermia, monitor volumes were adjusted, and the presence of a companion was allowed throughout the procedure.

During the C-section, the patient did not experience muscle rigidity or spasms. In the Postanesthesia Care Unit (PACU), the patient experienced lumbar spasms and moderate muscle contractions. which were treated with 10 mg IV diazepam. She was taken to the obstetric ward 6 hours later.

Discussion: Anesthetic management of patients with SPS reguires avoiding triggers of crises such as stress, pain, and hypothermia. Regional anesthesia is the preferred option, as it allows adequate pain control without the use of muscle relaxants or inhalation agents, which could induce postoperative hypotonia. General anesthesia, with the use of GABAergic drugs or muscle relaxants, has been associated with postoperative hypotonia. Additionally, maintaining the patient's usual treatment regimen is essential to prevent withdrawal syndrome.

Reference:

Pinto et al. Emergent Anesthetic Management in a Patient Recently Diagnosed with Stiff Person Syndrome. 2023 Oct 5; 16(10): e70899.

Learning Points: Regional anesthesia is ideal for patients with SPS, as it avoids avoids the use of muscle relaxants. Controlling stress, pain, and hypothermia during surgery is crucial to prevent spasms and other complications.

21AP02-1

Anesthesia management of a pregnant patient with pulmonary hypertension due to congenital heart disease: a case report

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Background: Congenital heart disease can lead to the development of pulmonary hypertension (PH-CHD) in 3%-10% of cases. According to the 2022 guidelines of the European Society of Cardiologyand Respiratory Societies, PH-CHD carries a high perioperative mortality andmorbidity risk, requiring multidisciplinary planning before surgery. This case report discusses the anesthesia management of a pregnant patient with PH-CHD.

Case Report: A 28-year-old pregnant woman at 30W2D gestation was referred from an external hospital toour obstetrics and gynecology clinic due to a threat of preterm labor, and C/S wasplanned. During the preoperative evaluation by our anesthesia and intensive care team, it was revealed that the patient had undergone a "Senning" procedure in childhood due to a diagnosisof transposition of the great arteries and ventricular septal defect, and she had a diagnosis of PH-CHD. Echocardiography showed an EF: 69% and pulmonary artery pressure (PAP) of 100 mmHg. The patient was transferred to the operating room, and standard monitoring was applied. SpO2 was increased from 84% to 89% with 3-4 lt/min oxygen supportvia nasal cannula. Radial arterial cannulation was performed, and the arterial blood pressurewas measured as 91/42 mmHq. A lumbar epidural catheter was placed in the sitting position. The epidural block extended up to the T8 level, and C/S was initiated. NO and O2 inhalation were administered vianasal delivery. An intravenous infusion of alprostadil at 0.1 µg/kg/min was started. The 37-minute C/S procedure was completed without any complications.

Discussion: Pregnant women with PH-CHD have a 30-40% risk of maternal mortality. Ongoing researchis focused on anesthesia techniques that can reduce high mortality and morbidity rates. In this case, we aim to contribute to the literature by presenting the anesthesia management of a pregnant patient with PH-CHD, which resulted in a favorable outcome without any mortalityor morbidity.

Reference:

J Cardiothorac Vasc. Anesth. 2021 Jul;35(7):2201-2211.doi: 10.1053/j.jvca.2020.06.062. Epub 2020 Jun 24.

Learning points: Multidisciplinary planning and careful preoperative evaluation are essential for managing pregnant patients with PH-CHD, as they face significant perioperative risks. Epidural anesthesia, combined with nitric oxide and alprostadil administration, can provide a safe and effective approach in high-risk PH-CHD cases.

Novel technique for managing a rare complication: a case report of epidural catheter retention

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Background: Epidural catheter placement carries a low risk of complications, including catheter retention or rupture, occurring in approximately 1 in 20,000-30,000 cases. No standard protocol exists for this rare issue.

We report a case of catheter retention during labor, successfully resolved using interventional radiology (IR).ur IR-guided technique offers a minimally invasive alternative to surgery, reducing morbidity and risks. To our knowledge, similar approaches are rarely reported.

Case Report: A 37-year-old primiparous woman at 39 weeks' gestation presented for labor. With no significant medical history, she requested epidural analgesia at 4 cm dilation. An epidural catheter was placed at the L3-L4 interspace using an 18G Tuohy needle. Resistance was encountered when withdrawing the catheter to the 10 cm mark, causing lumbar pain. Despite attempts including saline injections and positional changes, removal failed. To manage labor, we administered an initial 10-mL bolus of levobupivacaine 0.25% and fentanyl, achieving temporary analgesia. Patchy distribution later required placing a second catheter, which provided effective pain relief through delivery. Postpartum imaging revealed the retained catheter looped around the L2 spinous process in the paravertebral lumbar space without kinking or nerve involvement. After reviewing management options, we opted for a minimally invasive IR approach. The patient, sedated with midazolam and propofol, underwent catheter removal using a 0.014 FR guidewire inserted past the catheter tip. The procedure was successful, avoiding complications.

Discussion: Catheter retention may result from coiling, knotting, or entrapment in the vertebrae, lumbar fascia, or nerve roots. Removal attempts should include saline injection, positional adjustments, and waiting before applying excessive force. Imaging is essential if resistance persists or neurological symptoms occur. While retained catheters are often asymptomatic, complications like radicular pain, subdural hematoma, or stenosis may require laminectomy, which carries risks including CSF leaks, infection, or nerve injury.

References:

Brichant JF, Bonhomme V, Hans P. On knots in epidural catheters: a case report and a review of the literature. Int J Obstet Anesth. 2006;15(2):159-162.

Learning points: Management of retained epidural catheter

21AP02-5

Comparison of gastric volume using ultrasound in term pregnant patients undergoing elective cesarean delivery and patients undergoing pregnancy termination

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Background and Goal of Study: Physiological changes caused by increased progesterone and estrogen, along with anatomical changes that occur in later weeks of pregnancy, make pregnancy a standalone risk factor for pulmonary aspiration, which is a rare but serious complication of anesthesia for CS.

This study aims to compare preoperative pulmonary aspiration risks by measuring gastric diameters using ultrasound in term and early pregnant patients, and to evaluate the practicality of this method in routine clinical practice.

Materials and Methods: This study included 40 term pregnant patients undergoing elective cesarean section and 33 patients undergoing dilation and curettage for pregnancy termination before 12 weeks of gestation. In addition to gastric ultrasound measurements,data on height, age, weight, BMI,and ASA classification were recorded.

Patients were evaluated using ultrasound in supine and right lateral decubitus positions, with two different measurements taken from the epigastric region. Qualitative assessment of gastric fluid content was performed during imaging and graded as Grade 0,1 or 2. For quantitative analysis of gastric content, the anteroposterior and cranio-caudal diameters of the gastric antrum were

Cross-sectional area was calculated using the ellipse area formula CSA=AP×CC×π/4.

Gastric volume was calculated as GV(mL)=27+(14.6×CSA (cm2))-(1.28×age).

Results and Discussion: Patients in the CS group had significantly higher weight and BMI compared to the D/C group. The majority of patients in both groups exhibited Grade 0 findings (CS:85.0%,D/C:88.2%),with no significant differences in grade distribution.

There were no significant differences in CSA supine (p=0.195) or lateral (p=0.147) between groups. Gastric volumes (supine and lateral) were also comparable (p>0.05). A significant, moderate positive correlation was found between BMI and both CSA supine (p=0.0025) and lateral (p=0.0044).

Positive correlation between BMI and gastric CSA in both supine and lateral positions, suggests that higher BMI is associated with increased gastric CSA which may not be specific for pregnancy. The ultrasound duration showed no significant difference between the C/S and D/C groups, with both averaging 3.40 ± 1.55 minutes.

Conclusion: Despite demographic differences, the similarity in gastric measurements and qualitative grades across groups suggests that term pregnancy does not significantly affect preoperative gastric parameters or risk profiles.

21APO2-7 Efficacy, side effects and safety of intrathecal clonidine for caesarean delivery

intrathecal clonidine for caesarean delivery: a 12-year retrospective study

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Background and Goal of Study: To ensure optimal maternal well-being during caesarean delivery, off-label intrathecal additives such as lipophilic opioids or alpha-agonists are often used to intensify and prolong anaesthetic block. However, evidence regarding benefits and potential harms of intrathecal clonidine is limited to smaller randomized controlled trials.¹²

This study aimed to evaluate the efficacy, side effects and safety of intrathecal clonidine for caesarean delivery.

Materials and Methods: This single-centre retrospective cohort study was conducted at a university hospital in the Netherlands. Data from all caesarean deliveries with spinal anaesthesia, performed between July 1, 2011 and January 1, 2023, were extracted from electronic records (AnStat and HiX). Deliveries were grouped: hyperbaric bupivacaine (HB) with clonidine (clonidine group), HB with lipophilic opioids (sufentanil or fentanyl) (opioid group) and HB only (HB-only group). Hypotension was defined as systolic arterial pressure of <80% of the last pre-operative value or systolic arterial pressure <90 mmHg, across at least two consecutive measurements.

Results and Discussion: 6,103 caesarean deliveries under spinal anaesthesia were included: 31.4% in the clonidine group, 11.2% in the opioid group and 57.3% in the HB-only group. Intravenous additives and/or conversion to general anaesthesia was less frequent (p<0.001) in the clonidine group (13%), as well asin the opioid group (12%), both compared to the HB-only group (21%). Intraoperative hypotension was significantly more frequent in the clonidine compared to both the opioid group (65% vs 56%, p<0.001) and the HB-only group (65% vs 59%, p<0.001). Recovery room hypotension was more frequent in the clonidine group than in both the opioid and the HB-only group (43% vs 20% vs 19%, p<0.001). The need for neurology consultation was rare (0.3% in all groups).

Conclusion: Intrathecal clonidine and lipophilic opioids provide similar improvements to anaesthetic block. However, intrathecal clonidine increases the risk of hypotension. We suggest that its use should be reserved for selected cases.

References:

- 1. Crespo S. et al. Intrathecal clonidine as an adjuvant for neuraxial anaesthesia during caesarean delivery: a systematic review and meta-analysis of randomised trials. Int J Obstet Anesth 2017;32:64-76.
- 2. Roelants F, The use of neuraxial adjuvant drugs (neostigmine, clonidine) in obstetrics. Curr Opin Anaesthesiol 2006;19:233-7.

21AP02-8

A rare confluence: Intestinal obstruction and cesarean section at 33 weeks

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Background: We present a case of a 36-year-old woman at 33 weeks of gestation with intestinal obstruction following bariatric surgery. This scenario required urgent cesarean section, exploratory laparotomy, and segmental bowel resection, performed under combined spinal-epidural-general anesthesia

The case highlights the challenges of managing intestinal obstruction during pregnancy and the importance of tailored anesthetic strategies to optimize outcomes¹.

Case Report: A 36-year-old woman with a history recurrent intestinal obstruction following bariatric surgery developed a new episode of intestinal obstruction at 33 weeks of gestation requiring urgent surgery. She had no other comorbidities, and her pregnancy had been uneventful. After a multidisciplinary discussion, the following approach was decided. A thoracic epidural catheter was placed at T8-T9 for intraoperative and postoperative analgesia, then a spinal anesthesia at L4-L5 with bupivacaine (8 mg), sufentanil (2.5 μ g), and morphine (100 μ g) was performed for the cesarean section, which resulted in the delivery of a healthy neonate. General anesthesia was induced with fentanyl, propofol TCl, and rocuronium, and the patient was intubated using videolaryngoscopy. A total of ropivacaine 0,375% 12 ml was administered epidurally during surgery. The patient surgery and recovery underwent without complications.

Discussion: Acute abdomen during pregnancy is a diagnostic and therapeutic challenge. Around 2% of parturients require surgery for non-pregnancy-related indications. This case underscores the importance of individualized anesthetic planning in managing the rare combination of advanced pregnancy and intestinal obstruction. Regional anesthesia techniques enabled the mother to maintain her airway, minimize fetal drug exposure, and provide effective postoperative analgesia. This approach allowed the mother to remain awake during the cesarean section, ensuring safety for both mother and child.

Reference:

1. Wonte, M.M., Bantie, A.T., & Tadesse, M. (2023). A pregnant lady with compound bowel obstruction managed with thoracic epidural as sole anesthesia in a resource-restricted setting: A case report. *Journal of Medical Case Reports*, 17(231).

Learning Points: Surgical procedures during pregnancy require careful perioperative planning.

Posterior reversible encephalopathy syndrome (PRES) as a complication of eclampsia in two young primigravida patients

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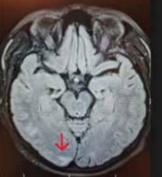
Background: Posterior reversible encephalopathy syndrome (PRES) was first described in 1996 by Hinchey et al. It is characterized by headaches, impaired consciousness, visual symptoms, nausea/vomiting, and focal neurological signs. As the name suggests, it is typically reversible once the underlying cause is treated.

Case Report: We report two cases involving 24 and 27-year-old primigravida women at 24/36 weeks of gestational age, with no medical history and otherwise normal pregnancies. Both presented to the emergency department with severe seizures, unconsciousness, and high blood pressure (both >180/90 mmHg), with laboratory tests suggestive of eclampsia. After stabilization, an emergency C-section was performed, followed by the transfer of the patients to intensive care. After extubation an early neurological evaluation with an emergency MRI were performed, because symptoms such as intense headache, vision disorder (blindness and photopsia) and agitation were presented on both patients. Reversibility of the symptoms after proper management and characteristic imaging on MRI led us to a diagnosis of PRES. Both patients were discharged after 5 days.









Discussion: In this cases PRES was a complication off eclampsia. PRES has generally good prognosis but severe complications can arise.

References:

- 1. A Reversible Posterior Leukoencephalopathy Syndrome | New **England Journal of Medicine**
- 2. Legriel: Understanding posterior reversible encephalopath... -Google Academic
- 3. Posterior reversible encephalopathy syndrome (PRES) in a patient with late postpartum eclampsia - PMC

Learning Points: PRES syndrome is a reversible entity when the aetiology is properly recognised and guickly treated. MRI of the brain is crucial to make a diferential diagnosis.

21AP02-10

Rare case of second-trimester termination of pregnancy due to severe pulmonary arterial hypertension (PAH)

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Background: Maternal mortality rates up to 33% are reported in case of PAH (mean pulmonary artery pressure (mPAP) > 20 mmHq)1. We describe the case of a second-trimester medical termination of pregnancy (MTP) in a patient belonging to group 1 (among 5 groups) PAH.

Case Report: A 39-year-old woman with severe PAH (mPAP of 73 mmHg) due to congenital right pulmonary artery agenesis and right lung hypoplasia presented at 15 weeks of gestation. She presented with mild dilation and moderate impairment of right ventricular function, pre-pregnancy six-minute walk test of 440 m, post-test oxygen saturation of 87%, and NT-proBNP of 168 pg/ml. Medications included macitentan, tadalafil, and spironolactone. After multidisciplinary counselling (patient classified mWHO Class IV), a MTP was decided.

An arterial line and a central venous catheter were placed in the cardiac intensive care unit (ICU), then an epidural analgesia with ropivacaine 0.1% and sufentanil 0.25 µg/mL was initiated after a test dose of 2% lidocaine without adrenaline.

Labour induction started with anti-progesterone mifepristone, then misoprostol (prostaglandin). Oxygen and low dose noradrenaline were administered. Delivery was planned in the cardiac ICU and occurred after six hours of labour. Oxytocin agonist Carbetocin was given.

Post-delivery, signs of pulmonary congestion and right heart decompensation required increased oxygen therapy and furosemide. The patient was discharged on day 8. Long-term contraception was proposed.

Discussion: Management of maternal PAH is critical, and multidisciplinary approach is essential. We chose vaginal delivery over curettage to reduce blood loss despite challenges associated with haemodynamic fluctuations during labour. Epidural analgesia provided effective pain control and stable haemodynamics, avoiding general anaesthesia, which could exacerbate pulmonary pressures and precipitate right ventricular failure.

Access to advanced monitoring and critical care facilities, including extracorporel membrane oxygenation in the ICU ensured patient safety.

1. Int J Obstet Anesth. 2024;59:104210

Learning Points: This report underscores the importance of tailored anaesthetic and obstetric planning for high-risk pregnancies due to PAH. Current literature predominantly focuses on term outcomes or first-trimester terminations. Limited data on second-trimester MTP requires the need for further research and clinical reporting to guide future management strategies.

21AP02-11

Anesthetic management of hereditary angioedema in pregnancy: a case report

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Background: Hereditary angioedema (HA) is a rare condition characterized by recurrent episodes of swelling due to C1 esterase inhibitor deficiency or dysfunction. Multidisciplinary care, short-term prophylaxis and postpartum surveillance must be carefully considered to avoid a life-threatening upper respiratory and laryngeal angioedema attack¹.

Case Report: We present a case of a pregnant 30-year-old woman with a personal history of type II HA scheduled for an elective caesarean. As prophylaxis, intravenous 1000 Units of plasma derived C1 inhibitor concentrate (pdC1-INH) were administered 1 hour before the caesarean. A combined spinal-epidural anaesthesia was performed and the caesarean proceeded without complications. The patient was transferred to the intensive care unit for postpartum monitoring and 24 hours after the caesarean additional intravenous 1000 Units of pdC1-INH were administered. There were no angioedema related complications.

Discussion: Pregnancy can increase the frequency and severity of angioedema attacks alongside with the physical and emotional trauma of labour and lactation. Angioedema typically occurs immediately after or within 48 hours of delivery². In case caesarean is needed regional anaesthesia is preferred to reduce the risk of an acute attack. Evidence based guidelines recommend prophylaxis with pdC1-INH before caesarean³ but few cases are described in the literature.

Additionally, clear communication with the Immunology consultant, emergency airway equipment and two additional doses of pdC1-INH should be available at all times.

References:

1. Valle M, Fernandez-Codina A, Pérez-Torrente C, et al. Hereditary Angioedema in Pregnancy: A Case Report and Review of Obstetric Anesthesia Management. A & A Practice. 2024;18(9):e01833.

2. Clark K, Givens J, Smith B, et al. Obstetric anesthetic management for parturients with hereditary angioedema: A case report and suggested protocol. Pain Med. 2021;22(8):1878–1882. 3. Magen E, Alesi G, El-Matary W, et al. Hereditary Angioedema During Pregnancy: Considerations in Management. Immunol Allergy Clin North Am. 2023;43:145-157.

Learning Points: A multidisciplinary approach and proper planning are essential in the obstetric management of a patient with HA. Short-term prophylaxis with pdC1-INH and careful postpartum monitoring must be considered.

21AP02-12

"Sitting tilt test" predicts hypotension during spinal anesthesia for elective cesarean section: a prospective observational study

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Background: Spinal anesthesia is the technique of choice during cesarean section. However, hypotension remains a major of concern. Accurate prediction of hypotension facilitates early intervention.

Goal of Study: To evaluate the preoperative benefit of a position change test on the occurrence of severe arterial hypotension after spinal anesthesia for scheduled c-section.

Materials and Methods: A prospective observational study was conducted at a tertiary maternity center during a period of 6 months. Parturients at term scheduled for elective c-section were included. "Sitting Tilt Test" (STT) was performed at the operating room: immediately before spinal anesthesia (bupivacaine10mg+s ufentanil2.5μg+morphine100μg), parturients were kept in supine position for 5min, than asked to move to a sitting position for 5min. At each position, a mean of 3 measurements of systolic arterial pressure (SAP) were noted. SAP of reference was considered at the supine position. A rise of the SAP by 10mmHg was considered as a positive STT. During C-section, SAP and heart rate were noted each 2min; total ephedrine consumption and Apgar scores were considered at the end of surgery.

Severe hypotension was defined as the drop of the SAP of reference by 30% and/or a SAP≤90mmHg. A 6mg bolus of ephedrine was administered to maintain 90% of the SAP of reference.

For results analysis, parturients were assigned to group P (positive STT) and group N (negative STT). Both groups were compared for hypotension incidence, total ephedrine consumption and Apgar scores. For statistical analysis p< 0.05 was considered as significant.

Results: A cohort of 220 parturients was included. A positive STT was observed in 36.82% (group P 81 parturients and group N 139 parturients). Mean BMI was significantly different among groups (p<0.001). Hypotension occurred in 114/220 parturients. Incidence of severe hypotension was 65.43% in group P and 19.42% in group N (p<0.001).

Total ephedrine consumption was significantly different among groups (9.28 \pm 8.8mg and 4.01 \pm 5.9 mg in group P and N respectively) (p<0.001). Apgar score was 10 at 5 minutes in the two groups.

Conclusion: Aortocaval syndrome, present in 10% of parturients, may exacerbate spinal block hypotension-sympatholysis. The sitting position alleviates aortocaval compression, enhance hemodynamic status and can predict hypotension. In our study, a positive "sitting tilt test" was associated with severe hypotension after spinal anesthesia.

21AP03-1

Successful management of pregnancy associated atypical hemolytic uremic syndrome (P-aHUS): a case report

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Background: Atypical hemolytic uremic syndrome (aHUS) is a life-threatening condition characterized by microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury (AKI). These patients constitute approximately 5-10% of hemolytic uremic syndromes. Pregnancy induced thrombotic microangiopathies (TMA) due to complement dysregulation are called as pregnancy-associated aHUS (p-aHUS) and are generally associated with poor maternal outcomes.

In this case report, we present a patient with p-aHUS, who was successfully treated.

Case Report: A 38-year-old G3P2 Caucasian female with suspicion of preeclampsia and HELLP syndrome, after undergoing a cesarean section at 35 weeks of gestation, was transferred to our hospital with diagnoses of severe thrombocytopenia, anemia and AKI.Initial investigations included special laboratory tests under the preliminary diagnosis of TMA. Due to the presence of marked schistocytosis in the peripheral smear, plasma exchange (PE) was initiated to address a suspected thrombotic thrombocytopenic purpura (TTP) diagnosis until ADAMTS13 activity results became available. Additionally, dialysis was started to manage AKI.

Subsequently ADAMTS13 activity was found to be within normal limits,the diagnosis was revised to aHUS and after vaccination against encapsulated bacterias, Eculizumab therapy, a monoclonal antibody against C5, was administered. With significant clinical improvement, the patient was transferred to the nephrology ward and Eculizumab therapy was continued during next two weeks in the ward and after discharge. Currently she is in clinical remission on eculizimab treatment and doing well.

Discussion: In cases of AKI encountered during pregnancy and the postpartum period, a thorough differential diagnosis must be made and p- aHUS shouldn't be overlooked.

Dashe, Jodi S., Susan M. Ramin, and F. Gary Cunningham." The longterm consequences of thrombotic microangiopathy (thrombotic thrombocytopenic purpura and hemolytic uremic syndrome) in pregnancy." Obstetrics & Gynecology 91.5 Part 1(1998): 662-668. Polo, E. Simón, et al." Management of atypical uremic hemolytic syndrome in pregnant patient." Revista Española de Anestesiología y Reanimación(English Edition) 69.4 (2022):245-248.

Learning Points: Early and accurate diagnosis and treatment, involving prompt PE and Eculizumab, is critically important to improve outcomes.

21AP03-2

Cyclical Horner's syndrome during labour analgesia

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Background: Horner's syndrome is caused by the interruption of the sympathetic input of head and neck nerves. Lumbar epidural is not expected to reach high thoracic levels associated with this syndrome. Though rare, it seems more likely in the obstetric population.

Case Report: We present the case of a healthy 38-year-old pregnant woman in active labour who underwent uneventful epidural catheter placement at L3-4 (epidural space at 4 cm, catheter advanced to 9 cm). According to local protocol, initial bolus of 14 mL of Ropivacaine 0,1% with 10µg Sufentanyl. As labor progressed, Ropivacaine concentration was increased to 0.2%, with 10 mL boluses given on demand.

After the second bolus, the patient reported a red, aching left eye without discharge or foreign body sensation. After initial try-outs of eye cleaning and hydration, light ptosis and miosis were noted ipsilaterally, but faded out and resolved spontaneously.

Subsequent boluses intensified symptoms, with obvious ptosis, miosis, warmth, and rubor on the ipsilateral hemiface, all of which resolved spontaneously after reassurance. An addition bolus and a new cycle of worsening and resolving symptoms happened. No additional boluses were necessary, and labour occurred without incidents

Discussion: Horner's syndrome from lumbar epidural is rare but more common in obstetric patients, likely due to narrowed epidural space, increased epidural pressure from uterine contractions, and heightened sensitivity to local anesthetics from elevated progesterone. Anatomical variations, with pupil-innervating fibers originating as low as T4, may also contribute.

We report a case of cyclical Horner's syndrome to highlight potential neuraxial block level rise. While our case had no serious outcomes, complications like maternal hypotension or respiratory distress must be considered.

References:

Chambers DJ, Bhatia K. Horner's syndrome after obstetric neuraxial blockade: A systematic review. Int J Obstet Anesth. 2018. doi: 10.1016/j.ijoa.2018.03.005.;Ray BS, Hinsey JC, Geohegan WA. Sympathetic nerve distribution to the pupil and upper extremity via anterior root stimulation. Ann Surg. 1943;118:647-55.

Learning Points: Serious complications of epidural analgesia are rare but become more severe as the level of the block rises. The obstetric population is particularly at risk for high neuraxial blockades, making clinical signs of Horner's syndrome especially concerning in this group. Careful monitoring is essential to ensure the well-being of both the mother and the foetus.

21AP03-5

Intravenous anxiolytic and analgesic administration during intrapartum cesarean delivery under different methods of neuraxial anesthesia: a retrospective study

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Background: Intraoperative anxiety, pain, and stress during cesarean deliveries performed under neuraxial anesthesia have been shown to adversely impact both maternal and perinatal outcomes. Consequently, minimizing these negative effects has become a key focus in obstetric anesthesiology.

The aim of this study was to evaluate the risk factors associated with the use of intravenous (IV) anxiolytics and analgesics during intrapartum cesarean deliveries, with specific attention to the method of neuraxial anesthesia employed - whether spinal, epidural, or combined spinal-epidural anesthesia - at our academic medical center.

Methods: This retrospective cohort study included women who underwent cesarean deliveries between January 2017 and June 2022, utilizing spinal anesthesia, epidural anesthesia, or combined spinal-epidural (CSE) anesthesia. Women who required conversion to general anesthesia or who were initially administered general anesthesia were excluded from the analysis. Neuraxial anesthesia and analgesia were administered according to a standardized protocol.

The study focused on the use of Midazolam, the most frequently used anxiolytic agent at our center, and examined the associated risk factors related to the anesthesia technique. The administration of fentanyl, ketamine, and propofol - commonly used intravenous analgesics - was also analyzed.

Results: Of the 7,325 women who underwent cesarean delivery under neuraxial anesthesia. 836 (11.4%) received IV anxiolytics and 400 (5.4%) received IV analgesics. Epidural anesthesia was a significant risk factor for both anxiolytic (OR 2.45) and analgesic (OR 3.33) administration, while spinal anesthesia reduced the likelihood of both (OR 0.45 for anxiolytics, OR 0.30 for analgesics). Combined spinal-epidural anesthesia was a statistically significant risk factor only for analgesic use (OR 1.8).

Conclusions: Around one in nine women received IV anxiolytics, and one in 20 received analgesics during cesarean delivery at our center.

These results suggest that spinal anesthesia is associated with reduced pain and anxiety compared to epidural anesthesia. The findings could inform improvements to epidural protocols for better pain management.

Additionally, they underscore the importance of patient education and the anesthesiologist's role in assessing the need for anxiolytics and analgesics.

21AP03-6

Dexmedetomidine as an adjuvant to local anesthetics in spinal anesthesia for cesarean section: an updated systematic review and metaanalysis of 17 randomized clinical trials

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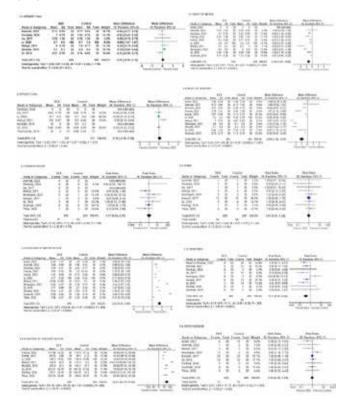
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Background and Goal of Study: Dexmedetomidine (DEX) is increasingly used in spinal anesthesia for cesarean sections due to its potential to enhance sensory and motor blockade and reduce shivering. Despite these potential advantages, its comparative efficacy and safety against placebo or no-intervention remain under-explored.

This meta-analysis assesses its efficacy and safety, focusing on block characteristics and maternal and neonatal outcomes.

Materials and Methods: We conducted a systematic review and meta-analysis comparing DEX versus placebo or no intervention in spinal anesthesia for cesareans. We searched PubMed, Embase, and Cochrane databases up to August, 2024. The primary outcome was shivering incidence.

Secondary outcomes included onset and duration of sensory and motor block, incidence of hypotension, bradycardia, nausea and vomiting, 1 and 5-minute APGAR scores. Review Manager, version 5.4.1, was used for pooled risk ratio (RR), and mean difference (MD) in random effect model.



Results and Discussion: Seventeen RCTs, totaling 1280 patients, were included. DEX significantly decreased the incidence of shivering (RR: 0.37: 95% CI 0.22: 0.62: p<0.001). Its use also prolonged sensory block by 72.21 minutes (95% CI 53.19; 91.22; p<0.001), and motor block by 1.52 hours (95% CI 1.15; 1.89; p<0.001). The onset time for sensory and motor block was significantly reduced by 0.98 minutes (95% CI -1.38; -0.57; p<0.001) and 1.18 minutes (95% CI -1.67; -0.68; p<0.001), respectively.

No significant differences were found for hypotension (RR: 1.01: 95% CI 0.72; 1.41; p=0.96), bradycardia (RR: 1.11; 95% CI 0.52; 2.36; p=0.78), nausea and vomiting (RR: 1.01; 95% CI 0.67; 1.52; p=0.96), 1-minute APGAR (MD: 0.05 points; 95% CI -0.09; 0.19; p=0.51), or 5-minute APGAR (MD: 0.10 points; 95% CI -0.10; 0.30; p=0.34).

Conclusion(s): Dexmedetomidine in spinal anesthesia for cesarean significantly reduced shivering incidence, decreased the onset time and increased the duration of both motor and sensory blocks. There were no differences regarding hypotension, bradycardia, nausea and vomiting, 1 or 5-minute APGAR scores.

21AP03-7

Anaesthetic management of schizencephaly and pregnancy: a case report

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Background: Schizencephaly is a rare congenital brain malformation that can lead to neurological deficits, such as hemiparesis. Few case reports have described schizencephaly, and none have focused on anesthetic care. This case is unique due to the combination of schizencephaly and placenta previa in a pregnant woman scheduled for a cesarean section.

Case report: A 30-year-old woman, 37 weeks pregnant, with unilateral schizencephaly and mild right hemiparesis was scheduled for an elective C-section due to placenta previa. A few days before surgery, she reported transient sensory changes in her left upper limb, so a preoperative neurological evaluation was done, which revealed no new deficits and normal cognitive function. Neurology attributed this to probable compressive neuropathy from positioning or pregnancy-related tissue edema, without contraindication for cesarean delivery. Concerned that neuraxial techniques might worsen her condition, the patient opted for general anesthesia, a decision made after discussing the available options. Monitoring consisted of standard ASA, BIS and TOF. Careful positioning was assured to prevent compressive neuropathies during surgery. Rapid sequence induction was used and anesthesia maintained with sevoflurane. Rocuronium mantained neuromuscular blockage; pain was managed with multimodal analgesia, and oxytocin was administered for uterine contraction. The surgery and postoperative period were uneventful, the patient remained neurologically stable and delivered a healthy newborn.

Discussion: Schizencephaly presents an anesthetic challenge due to its rarity and the diverse neurological symptoms. Pregnancy and placenta previa add further complexity to perioperative care. Despite no known contraindications to general or regional anesthesia, the patient's concerns were addressed, and her preference for general anesthesia was respected. To our knowledge, there are no studies on anesthetic management in schizencephaly patients, emphasizing the importance of further reporting to guide anesthetic management in similar future cases. This case highlights the need for individualized anesthetic plans. interdisciplinary collaboration among neurology, anesthesiology, and obstetrics.

Reference:

Halabuda, A. et al.(2015) Childs nerv syst,31(4), 551-556.

Learning points: Schizencephaly is an anesthetic challenge due to its rarity and should be managed multidisciplinary. Patient preferences should be prioritized.

21AP03-9

Right atrial angiosarcoma in a pregnant patient: a rare and complex anesthetic challenge during cesarean delivery

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Background: Cardiac tumors during pregnancy are extremely rare diagnoses. Right atrial tumors can cause right atrial enlargement, arrhythmias, functional tricuspid stenosis, and right heart failure due to intracardiac obstruction, presenting challenges during positioning, anesthesia, and surgery1.

Careful planning is essential considering oncological care alongside maternal-fetal safety. Epidural blockade is beneficial for maintaining effective surgical conditions and analgesia, allowing for incremental administration of local anesthetics.

This approach may reduce the speed of onset and extent of sympathectomy, minimizing hemodynamic changes and facilitating compensatory interventions, especially vital for pregnant patients with cardiopulmonary risks.

Case Report: A 39-year-old woman at 32 weeks gestation presented with two weeks of retrosternal pain, dyspnea, and lipothymia. She was tachycardic but normotensive. An echocardiogram was performed due to suspected pulmonary thromboembolism, revealing a large pericardial effusion, prompting urgent pericardiocentesis. Persistent chest pain on day two led to a repeat echocardiogram, which identified two right atrial masses with no obstruction to venous return.

After completing antenatal corticosteroid therapy, she was scheduled for elective cesarean delivery. An epidural block was performed at the L3-L4 level using 10 mL of 0.75% ropivacaine. Standard ASA monitoring and an arterial line in the left radial arterv were established.

The surgery was uneventful, resulting in a successful delivery. The epidural catheter was removed postoperatively to facilitate anticoagulation therapy. Subsequent evaluations confirmed a diagnosis of right atrial angiosarcoma.

Discussion: Data on cardiac angiosarcoma in pregnancy are primarily case reports1. The epidural blockade in this case limited systemic drug exposure while providing effective pain control during cesarean delivery. This case demonstrates the importance of a multidisciplinary approach and highlights appropriate anesthetic techniques in such complex scenarios.

Reference:

1. Kudlicki J, Kania A, Frania-Baryluk A, Tomaszewski A, Wysokiński A, Czekajska-Chehab E. Right atrial angiosarcoma in a pregnant woman: diagnostic and therapeutic dilemmas. Pol Arch Intern Med. 2018 Feb 15;128(2):129-131.

Learning points: Managing a pregnant patient with cardiac tumors necessitates a tailored anesthetic approach, with regional anesthesia being a valuable alternative.

21AP03-10

High-risk pregnancy: multidisciplinary management of severe aortic insufficiency – a case report

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Background: Valvular heart disease in pregnancy poses significant risks to maternal and fetal health. Management requires a multidisciplinary approach involving precise diagnosis, disease severity assessment, and individualized strategies during pregnancy, labor, and the postpartum period, when complications are most likelv1,2.

Case Report: A 40-year-old woman with severe aortic insufficiency was admitted at 38 weeks and 4 days for labor induction. Cardiology evaluation confirmed no contraindication for vaginal delivery, as criteria such as an aortic diameter >45 mm, severe aortic stenosis, or significant heart failure were absent. Epidural analgesia was initiated with ropivacaine 0.2% (12 mg) and sufentanil (10 mcg), alongside invasive arterial monitoring to ensure hemodynamic stability. Protracted labor and maternal factors necessitated a cesarean section. After weighing the risks of her cardiac condition, epidural anesthesia with ropivacaine 0.75% (75 mg) was administered. Postoperatively, the patient was monitored in the post-anesthetic care unit for 48 hours for signs of cardiac decompensation. She was discharged in stable condition without complications.

Discussion: Severe aortic insufficiency during pregnancy requires careful management due to hemodynamic fluctuations during labor3. Epidural anesthesia provided effective analgesia and hemodynamic control, while invasive monitoring ensured stability. Postpartum monitoring was essential, as this period carries a heightened risk of cardiac decompensation. This case highlights the importance of individualized anesthetic strategies and coordinated multidisciplinary care in high-risk pregnancies with significant cardiac conditions.

References:

- 1. Ducas RA et al. Pregnancy outcomes in women with significant valve disease: a systematic review and meta-analysis. Heart. 2020.
- 2. Mulder BJM et al. Valvular heart disease in pregnancy. N Engl
- 3. Regitz-Zagrosek V et al. 2018 ESC Guidelines for the management of cardiovascular diseases during pregnancy. Eur Heart J. 2018.

Learning points: The rising maternal age and prevalence of comorbidities add complexity to managing high-risk pregnancies. Specialized training in invasive hemodynamic monitoring and a multidisciplinary approach within the labor and delivery unit are essential to optimize outcomes for pregnancies complicated by severe cardiac conditions.

21AP03-11

Peripartum anesthesia management in high-risk pregnancy after heart transplant: mother and child are doing well!

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Background: A growing number of female heart transplant recipients is at childbearing age. Pregnancy is considered an immune system sensitizing period and associated with transplant rejection and heart failure.

Multidisciplinary planning is critical for these high-risk pregnancies and anaesthesiologists play a key role in the peripartum period. (1)

Case Report: 32-year-old G2P1, 36 weeks of gestation, status post heart transplant in 2010. First line antirejection medication (ARM) - mycophenolate, cyclosporine, prednisone- was stopped in 2019 and azathioprine initiated after pre-conception counselling. First pregnancy in 2021 was uneventful, however ARM was continued with azathioprine.

The patient's second pregnancy was complicated by heart failure (NYHA III), arrhythmia (epicardial pacemaker since 2010) and therefore suspected rejection. After maximizing heart failure therapy, decision was made to deliver with caesarean section (CS) at 36 weeks in May 2024.

CS was safely performed in spinal anaesthesia, involved invasive arterial blood pressure monitoring, external defibrillation pads, frequent transthoracic echo exams in the peripartum period and biomarker monitoring (NTproBNP).

A cardiac biopsy was negative for rejection and heart failure and arrhythmia improved over time.

Discussion: Second pregnancy after heart transplantation with long-term cessation of standard ARMs is considered high-risk (mWHO classes II-III). Risk of rejection, graft arteriosclerosis are higher with second line ARM, first line ARM pose teratogenic risks, leading to higher miscarriage rates.

Maternal cardiovascular disease is associated with significant maternal-fetal morbidity. However, two-thirds of pregnancies in heart transplant recipients according to large registries have

This case highlights the importance of a multidisciplinary approach, developing a plan, educating the patient and their families. Participation in international registries, further research and guidelines are needed to support these high-risk patients effectively.2,3

References:

- 1. Circ Heart Fail 2020(13): Practice Patterns Surrounding Pregnancy After Heart Transplantation
- 2. J of Heart Lung Transplant 2020 39(5): Pregnancy outcomes in heart transplant recipients
- 3. JACC Heart Fail 2023(4): Maternal and Pregnancy Outcomes Following Heart Transplantation

Learning points: This case presents perioperative anaesthesia management in a high-risk pregnancy after heart transplantation.

21AP03-12

Effect of transversus abdominis plane block in cesarean section on platelet/lymphocyte ratio

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Background and Goal of Study: Postoperative pain is associated with tissue trauma and release of inflammatory mediators. The proinflammatory cytokine response due to the surgical stress: causes postoperative pain, increased opioid use, delay in healing and prolongation in recovery time. Platelet/lymphocyte ratio is one of the markers of inflammatory stress response. Transversus abdominis plane (TAP) block is one of the abdominal blocks commonly used in the treatment of acute postoperative pain for lower abdominal surgery.

Our aim was to show the effect of TAP block on postoperative pain, therefore on platelet/lymphocyte ratio.

Materials and Methods: Between January 1st and November 1st 2023, female patients between the ages of 18-45 who were classified as American Society of Anesthesiology (ASA) I-II-III and underwent cesarean section (CS) were included to the study.

After reviewing the data of a total number of 62 patients, it was found that transversus abdominis plane block had been applied to 30 patients.

Age, comorbid diseases, Visual Analog Scale (VAS) scores at 6th-12th-24th. hours postoperatively, platelet/lymphocyte ratios, pre and perioperative arterial blood pressures, heart rates and oxygen saturations were reviewed.

Results and Discussion: No statistically significant difference was found in terms of VAS scores at the 6th, 12th and 24th hours (p>0,05). Time to first postoperative analgesic need was significantly shorter in the no block group (p< 0.001). But, no statistically significant difference was found in terms of platelet/lymphocyte ratio (p>0.05).

Our results on platelet/lymphocyte ratio may be due to the fact that the minimally invasive intervention performed during the block may have increased the inflammation, albeit locally.

Conclusion(s): TAP block performed after CS, is a practical analgesia method with a low side effect profile which is safe for both mother and baby.

Although our results did not show the effect of TAP block on inflammatory stress response, this study will shed light on studies to be conducted in larger groups in order to reduce the use of analgesic agents and related complications.

21AP04-1

Determination of optimal dose of intrathecal morphine for postoperative analgesia after cesarian section using up & down sequential allocation

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Background and Goal of Study: Neuraxial blocks are the gold standard in obstetric anesthesia, particularly in cesarean section (CS), which can lead to significant postoperative pain when undertreated. Intrathecal administration of opioids is effective for postoperative pain, allowing lower doses while reducing side effects. Subarachnoid morphine provides prolonged analgesic effects, lasting 18 to 24 hours after administration.

This study aims to investigate the optimal dose of intrathecal morphine in healthy parturients undergoing CS, with the primary goal of assessing effective analgesia (Numerical Rating Scale/ NRS ≤3/10) for at least 12 hours post-administration.

Materials and Methods: We present the preliminary results of a prospective, non-randomized, double-blind trial where a fixed dose of fentanyl and a variable dose of ropivacaine, along with morphine is administered. Morphine dose is determined by a sequential allocation algorithm based on the previous participant's analgesic response. Successful analgesia is defined as a NRS≤3 for at least 12 hours post-injection. If analgesia is successful, the morphine dose for the next participant is decreased by 20mcg; if unsuccessful, it is increased by 40mcg.

All parturients receive the same multimodal analgetic regimen postoperatively, including paracetamol and nonsteroidal anti-inflammatory drugs (NSAIDs).

Results and Discussion: Forty-two ASA II term parturients scheduled for elective CS under spinal anesthesia were included. The first patient was assigned 100mg dose of intrathecal morphine, based on common clinical practice. In our cohort, the lowest dose of morphine was 20 mcg, and the highest dose was 140mcg. Postoperative pain and adverse effects were monitored for 24 hours. No major adverse effects were observed. Most of the participants reported high levels of satisfaction.

Centered Isotonic Regression (CIR) was applied to the dose response data for ED50 determination. All tests were two-tailed and statistical significance was established at 5% (p<0.05). In our cohort, the median effective dose of intrathecal morphine (ED50) was 40mcg with a 90%C.I. (0-67.08).

Conclusion(s): Low doses of intrathecal morphine seem to be an effective approach for postoperative analgesia after CS, minimizing side effects associated with opioids.

21AP04-2

Impact of cesarean section decision-to-delivery intervals on neonatal outcomes: a prospective audit

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Background and Goal of Study: Adherence to decision-to-delivery (DDI) recommended intervals for Grade 1 and 2 cesarean sections is a cornerstone of safety in Obstetric Anesthesiology (1). The primary objectives of this study were to audit DDI times for Grade 1 and 2 cesarean sections and assess their association with neonatal outcomes in a district hospital in Portugal.

Materials and Methods: A prospective audit was conducted, including all pregnant women undergoing cesarean sections during August and September of 2023. Using electronic medical records, the DDI intervals for Grade 1 and 2 cesarean sections were reviewed, along with neonatal outcomes, specifically Apgar scores, need for resuscitation, presence of laboratory markers of asphyxia, requirement for admission to the Neonatal Special Care Unit, and complications identified at 1 year.

Results and Discussion: During the audit period, 50 cesarean sections were performed, of which 11 were classified as Grade 1 or 2 (22%). Among these, 3 (27%) were Grade 1 cesarean sections. DDI intervals for Grade 1 and 2 cesarean sections adhered to national and international guidelines in 82% of cases (1,2). The most commonly used anesthetic technique was balanced general anesthesia (45%), and the most frequent indication for cesarean section was non-reassuring cardiotocography (55%). The lowest 1-minute Apgar score (1) was observed in the only Grade 1 cesarean section that did not meet the recommended DDI. For all other cases, the 1-minute Apgar score was ≥8. Among the three neonates requiring resuscitation (all with Apgar scores <8), the stipulated DDI interval was met in two cases. In this sample, no admissions to the Neonatal Special Care Unit or complications at 1 year were reported.

Conclusion(s): The key findings from this audit are:

- 1. DDI intervals partially meet national and international targets, highlighting the need for improvement.
- 2. In Grade 1 cesarean sections, failure to meet the stipulated DDI time was associated with a low 1-minute Apgar score, although recovery to a score of 8 was observed by the 5th minute.
- 3. The absence of long-term complications, even among the three neonates requiring neonatal resuscitation.

Reference:

1. Anaesthesia 2020 76:5 665-680

21AP04-3

Beyond bleeding: managing hyperthermia in post-cesarean misoprostol use, two case reports

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Background: Misoprostol is commonly used for postpartum hemorrhage (PPH). While fever is a well known side effect of misoprostol1, severe hyperthermia with altered mental status is a rare but potentially fatal complication associated with its administration2. We report two cases of hyperthermia after misoprostol administration, to enhance awareness of this potential adverse effect and promote safer clinical practices.

Case Report: We report two cases, a 30 year old and a 34 year old women with no significant medical history. To achieve proper uterine contraction in the setting of PPH, sublingual misoprostol was administered (800 mcg in the first case, 600mcg in the second). Hours later, both developed a clinical tetrad of altered mental status, tachycardia (160-170 bpm), shivering and high temperature (41°C - 42°C measured transtympanic).

Immediate interventions included active cooling measures and intravenous administration of paracetamol and benzodiazepine (10mg diazepam and 3mg midazolam, respectively=. One case was refractory to these measures and required sedation, intubation and ICU transfer for advance care; the other resolved after further administration of IV methamizole, bicarbonate (due to metabolic acidosis in arterial blood gas) and dantrolene. Both patients made a full recovery within 24 hours and were discharged home safely on postpartum day 3.

Discussion: Severe hyperthermia with altered mental status is a major adverse effect of misoprostol. Sublingual and oral administration, compared to vaginal or rectal routes, are preferable but carry a higher risk due to rapid absorption and elevated peak plasma concentrations. Genetic predisposition may be associated with increased susceptibility. Prompt recognition and management of hyperthermia is critical, with dantrolene being a potential option when conventional treatment such as active cooling, antipyretics, and benzodiazepines are ineffective.

References:

- 1. León W, et al.; Dose and Side Effects of Sublingual Misoprostol for Treatment of Postpartum Hemorrhage: What Difference Do They Make?; BMC Pregnancy and Childbirth. 2012
- 2. Kaiser J, et al.; Profound hyperthermia after postpartum rectal misoprostol administration; Obstetrics and Gynecology; 2016

Learning points:

- Enhanced awareness and early recognition of severe hyperthermia can improve patient safety and outcomes
- Supportive care, including antipyretics and active cooling measures, is key in managing misoprostol-induced hyperthermia.

21AP04-4

Evaluation and experience on the application of the internal guideline of walking epidurals in a regional hospital in Barcelona

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Background and Goal of Study: Epidural analgesia is the most effective pain management method during childbirth. However, it has well known secondary effects associated with local anesthetic concentration, such as lower-body motor blockade. A new low-dose approach known as walking epidural (WE) allows patients to move. Studies suggest adopting different positions is beneficial during labor and could even help delivery. WHO and the Spanish Ministry of Health encourage these patients to adopt positions that provide them with the most benefit and comfort. Our hospital developed its own guideline for WE, detailing considerations for appliance and register. The aim of this study was to determine the frequency of WE in our hospital, as well as to summarize population and procedure characteristics and to evaluate quideline compliance.

Materials and Methods: Descriptive data study of patients who underwent WE in our hospital from October 2023 to September 2024. A checklist was applied to verify guideline compliance based on patient assessment, procedures registration and midwife availability. All patients signed informed consent.

Results: 36 WE were registered, 0 - 5 per week, accounting for 4,5% of all deliveries under epidural analgesia for a year. The mean data for age was 33 years old (ages 20-40), 39 weeks gestational age, mostly primigravidae and a mean BMI of 29,1. They requested WE technique at 4 cm of cervical dilation. 22% of cases delivered at WE dose, while the rest required change to conventional doses. A mean of 4 bolus were administered at WE dose in both instances. During this period, 72% of patients changed position, walked or used a ball. 73% of cases were properly registered, complying all checklist items. Of the remaining cases, >60% of items were registered and only lacked motor blockade notes.

Conclusions: Walking epidurals are gaining popularity due to their benefits. Larger centers are not usually able to carry them out due to resource limitations. While epidural analgesia is commonly performed in our regional hospital, WE is still not frequent but it is on the rise. Some improvements need to be made regarding proper registration, through better tools, to provide the best possible care. Patient satisfaction could be included in future evaluation as a quality parameter.

Reference:

De Verastegui M. Influence of Laboring People's Mobility and Positional Changes on Birth Outcomes in Low-Dose Epidural Analgesia Labor. JMWH.2023Jan;68(1):84-98.

21AP04-5

Vaginal delivery in the context of acute aortic dissection: A case report

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Background: Acute aortic dissection during pregnancy is a rare but life-threatening complication1 often overlooked due to symptom overlap with obstetric conditions. This case highlights the anesthetic and multidisciplinary challenges of managing an undiagnosed type A agrtic dissection during vaginal delivery.

Case Report: A 34-year-old secundipara at 35.2 weeks of gestation presented with four days of persistent left parasternal chest pain radiating to the back, worsened by deep breathing and accompanied by low-grade fever. Initially discharged from another hospital with negative findings, her symptoms persisted. On admission, she was hemodynamically stable, with leukocytosis, elevated D-dimer, and unremarkable imaging and ECG findings. Chorioamnionitis was suspected, and empirical antibiotics were started alongside labor induction. Despite epidural analgesia with low-concentration levobupivacaine (0.125%), she experienced two hypotensive episodes, which were managed with fluids and prompt phenylephrine bolus. After vaginal delivery, persistent chest pain and hypotension prompted further evaluation. Interarm blood pressure differences (95/50 mmHg vs. 125/75 mmHg) and asymmetrical pulses led to a postpartum CT angiogram, confirming a type A aortic dissection involving the ascending aorta. Emergency Bentall surgery was performed, and the patient recovered uneventfully.

Discussion: Pregnancy-induced hemodynamic changes increase the risk of aortic dissection², particularly in the third trimester, and are further heightened in individuals with underlying conditions such as Marfan syndrome. While cesarean delivery is typically preferred in such cases, epidural analgesia and phenylephrine successfully stabilized maternal and fetal hemodynamics in this scenario, enabling a safe vaginal delivery.

References:

1. Yuan SM. Clinical Features and Outcomes of Pregnancy-Related Acute Aortic Dissection. JAMA Cardiol. 2020;5(9):1051 De Martino A, et al. Acute Aortic Dissection and Pregnancy: A Meta-Analysis. J Card Surg. 2019;34(11):1591

Learning points: Delayed diagnosis, attributed to atypical symptoms and imaging challenges, underscores the importance of considering aortic dissection in pregnant patients with persistent chest pain. Multidisciplinary collaboration and prompt diagnosis are essential for managing this rare condition. Epidural analgesia and vasopressors can stabilize hemodynamics, making vaginal delivery a viable option in carefully selected cases.

21AP04-6

Imaging strategies for diagnosing aortic dissection in pregnant women: A systematic review of current evidence

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Background and Goal of Study: Aortic dissection (AD) during pregnancy is rare but life-threatening, requiring immediate diagnosis to guide treatment. In the third trimester and labor, delays often stem from concerns about fetal radiation exposure, imaging logistics, and overlapping symptoms with obstetric conditions. This review evaluates diagnostic modalities for AD in pregnancy. focusing on safety, accuracy, and feasibility in emergencies.

Materials and Methods: A systematic review was conducted across MEDLINE, Embase, Cochrane Library, and SCOPUS, targeting studies published up to November 2024. Search terms included "Pregnant women," "Aortic dissection," "CT angiography," "MRI," "Echocardiography," and "Fetal radiation exposure." Articles on third-trimester or labor-related protocols were criti-

cally appraised, excluding duplicates and low-quality data.

Results and Discussion: CT angiography (CTA) is the gold standard, with sensitivity and specificity exceeding 95%. Radiation doses (0.01-0.66 mGy) are considered safe for the fetus when beam collimation and shielding are applied. Transthoracic echocardiography (TTE) offers rapid bedside assessment but is operator-dependent and limited for the ascending aorta. Transesophageal echocardiography (TEE) provides superior resolution but requires sedation, complicating use during labor. MRI, though radiation-free and accurate, is less accessible in emergencies due to cost and imaging time. CTA is optimal in acute settings, balancing speed and diagnostic accuracy, while TTE is valuable for initial triage. The lack of standardized protocols contributes to variability in diagnostic approaches, emphasizing the need for tailored strategies.

Conclusion: Early and accurate diagnosis of AD is crucial to prevent severe complications. CTA with beam collimation and appropriate imaging parameters to reduce radiation dose while maintaining adequate image quality may be the most popular modality in emergencies.

Future efforts should focus on developing standardized, pregnancy-specific diagnostic protocols that balance clinical urgency, imaging availability, and safety.

21AP04-7

Peripartum anesthetic management in a patient with C1 inhibitor deficiency hereditary angioedema

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Background: Hereditary angioedema (HAE) is a rare genetic disorder leading to recurrent episodes of swelling. Pregnancy can exacerbate HAE due to estrogen fluctuations, peripartum stress and trauma. We are reporting the peripartum anesthetic management of a patient with HAE due to C1 inhibitor deficiency who underwent labor induction and vaginal delivery with neuraxial analgesia.

Case Report: A 42-year-old patient G2P0 presented to an anesthetic consultation at 36 weeks of gestation with the diagnosis of C1 inhibitor deficiency HAE. Her known triggers were cold exposure, capsaicin, and surgical procedures. During pregnancy, she did not require HAE-specific medication and remained symptom free. She presented predominantly with abdominal crises exacerbated by invasive procedures, including fertility treatments despite prophylactic C1 inhibitor concentrate administration.

After a multidisciplinary meeting involving obstetrics, anesthesiology, and immunoallergology, labor induction at 39 weeks was planned, targeting vaginal delivery with early epidural analgesia. Prophylactic 1000U of C1 esterase inhibitor concentrate was administered prior to labor induction and difficult airway equipment was prepared and nearby throughout her hospital stay.

Vaginal delivery was complicated by fetal distress, requiring obstetric assistance and neonatal resuscitation. Both mother and baby were discharged 5 days later without further complications. **Discussion:** Pregnancy and labour's impact on HAE is variable. with no universally preferred mode of delivery. However, international guidelines report that 90% of births in HAE patients are vaginal.2 The C1 inhibitor deficiency subtype attacks are not caused by histamine and are therefore not responsive to antihistaminic or corticoids. First-line treatment involves C1 esterase inhibitor concentrate, also used prophylactically in high-risk situations. Neuraxial analgesia helps control potential triggers of acute angioedema during delivery. In this case, vaginal delivery was well-tolerated, with no acute angioedema episodes.3

References:

- 1. World Allergy Organ J. 2022;15:100627.
- 2. J Allergy Clin Immunol. 2012;129:308-320.
- 3. J Allergy Clin Immunol. 2004;114:S51-S131

Learning points: Tailored multidisciplinary planning and proactive anesthetic strategies are required in managing pregnant patients with HAE.

21AP04-9

Bronchial artery embolization during pregnancy: an unusual multidisciplinary challenge - case

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Background: Interventional radiology (IR) has an established role in managing conditions and complications in pregnancy 1.

Non-obstetric procedures in pregnancy are a great challenge to anesthesia due to its physiological changes and risks to mother and fetus safety 2.

Case Report: A 30-year-old female, American Society of Anesthesiology (ASA) physical status III, 28 weeks and 1 day pregnant, had a history of alpha-1 antitrypsin deficiency, complicated by frequent hemoptysis due to varicose bronchial ectasia. Due to risk of worsening during labor, elective pre-delivery embolization was decided.

The procedure was planned by the Radiology, Anesthesia and Obstetrics (OB) team with support from the Hospital Physicist and was performed in left lateral decubitus position under monitored anesthesia care with ASA standard monitoring.

To minimize fetal radiation exposure, we used low-dose pulsed fluoroscopy, reduced the number of digital subtraction angiograms, limited the imaging range, and applied digital zoom for clearer images without increasing radiation.

Fetal well-being was confirmed by the OB team before and after the procedure.

The interventional radiology team successfully performed the angiographic embolization through a femoral artery puncture with no complications.

Discussion: Special considerations concerning radiation exposure, drugs for anesthesia, contrast, and timing of IR interventions must be taken 1.

Anesthetist is an advocate of fetus and maternal safety by avoiding potentially harmful drugs, ensuring proper uteroplacental perfusion and preventing or managing preterm labor and delivery2. In case of radiation use, it is adamant a multidisciplinary discussion to optimize iodine contrast and radiation dosing and minimize maternal and fetal exposure, which must be monitored and recorded 1,2. In procedures outside the abdomen/pelvis, the use of a lead shield is currently questioned 1.

References:

- 1. Moirano J, Khoury J, Yeisley C, et al. (2023) Interventional Radiology and Pregnancy: From Conception through Delivery and Beyond. J Vasc Interv Radiol; 43 (8).
- 2. Van De Velde M, De Buck F. (2007). Anesthesia for non-obstetric surgery in the pregnant patient. Minerva Anestesiol, 73(4), 235-240.

Learning points: IR procedures during pregnancy are associated with specific challenges. Close collaboration among anesthesiologists, OB/GYN, and interventional radiologists ensures the best outcomes for both mother and fetus.

21AP04-10

A balancing act: Anesthetic management for aortic dissection in a pregnant patient

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Background: Aortic dissection in pregnancy is a rare but critical emergency requiring urgent surgical intervention. Physiological changes in pregnancy increase the risk of maternal and fetal morbidity (1). Anesthetic management in these cases is complex and demands meticulous planning.

Case Report: A 35-year-old pregnant woman, with chronic hypertension and an MYH11 gene mutation, was admitted at 34 weeks gestation due to decreased fetal movements and hypertension. She experienced sudden severe chest pain and syncope, leading to the diagnosis of aortic dissection. Upon admission, her hemodynamic instability necessitated urgent transfer to a tertiary care center for cesarean delivery and cardiothoracic surgery. Continuous infusions of labetalol and isosorbide dinitrate were used to manage blood pressure, with fentanyl for acute pain relief. At the surgical site, she was conscious, stable, and had a normal neurological exam. Rapid sequence induction with propofol and remifentanil preceded an urgent C-section, resulting in the birth of a healthy male infant. Post-delivery, the focus was on repairing the ascending aorta while maintaining hemodynamic stability. NIRS monitoring confirmed adequate cerebral perfusion, and procedures utilized total intravenous anesthesia.

Despite successful surgery, including 99 minutes of aorta clamping and resuscitation with noradrenaline, dobutamine, and plasma, the patient was unresponsive on postoperative day one. Neurological imaging indicated extensive brain ischemia, resulting in brain death on day three. The neonate was discharged without complications.

Discussion: This case underscores the importance of anesthetic management in high-risk cardiovascular surgeries during pregnancy. Effective monitoring and medication adjustments are critical to balancing maternal stability and fetal safety.

1. Regitz-Zagrosek V, et al. 2018 ESC Guidelines for the management of cardiovascular diseases during pregnancy. Eur Heart J 2018;39:3165-241. doi:10.1093/eurheartj/ehy340

Learning points: Anesthesiologists must navigate the complexities of emergent surgery in pregnant patients, focusing on neuroprotection and hemodynamic stability. A multidisciplinary approach improves outcomes, though significant risks persist in such high-stakes situations.

21AP04-11 **EBUS-TBNA** in pregnancy: Is airway topicalization the key?

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Background: Anesthetic management for endobronchial ultrasound transbronchial needle aspiration (EBUS-TBNA) in pregnancy presents significant challenges due to physiological changes. altered feto-maternal pharmacokinetics, procedural limitations particularly regarding airway access - and the complexity of performing anesthesia outside the operating room¹.

Case Report: A 28-year-old primigravida at 16 weeks of gestation was referred for urgent EBUS-TBNA due to suspicious mediastinal lymphadenopathy, presenting mild dyspnea but no signs of airway obstruction.

Following a multidisciplinary discussion, general anesthesia was selected as the preferred approach. Obstetric evaluation confirmed normal fetal well-being both pre- and post-procedure. Standard American Society of Anesthesiologists monitoring was applied, and aspiration prophylaxis was administered. Airway topicalizationwas achieved using 10 mL of 2% lidocaine delivered via MADgic®.

Total intravenous anesthesia was induced with target-controlled infusion of Propofol 1%, alongside Lidocaine 1 mg/kg and Rocuronium 1 mg/kg. A size 4 AuraGain™ laryngeal maskairway (LMA) was inserted, with subsequent gastric aspiration revealing nocontents. An additional 5 mL of 2% lidocaine was instilled through the EBUS bronchoscope to enhance airwaytopicalization.

The procedure was completed without complications, and fetalwell-being was preserved throughout. No opioids were administered during the procedure.

Discussion: Performing EBUS-TBNA in pregnant patients presents unique challenges, including airway narrowing, hypoxia, and increased aspiration risk, particularly in later trimesters. However, evidence supports the safe use of a laryngeal mask airway with careful management. Adequate airway topicalization minimizes reflexes and reduces opioid use, enhancing maternal comfort and

With no established anesthesia protocols for pregnant patients, management must prioritize fetal outcomes while addressing risks like prematurity and neonatal complications. A multidisciplinary approach is critical to ensuring the safety of both mother and child throughout the procedure.

Reference:

1. Becker, C. https://doi.org/10.1186/s12871-024-02551-4

Learning points: Laryngeal masks can offer safe airway management for transbronchial biopsy in pregnancy with careful anesthesia, fetal monitoring, and multidisciplinary coordination.

Effective airway topicalization minimizes opioid use, enhancing maternal and fetal safety.

Respiratory distress following spinal anesthesia for cesarean section: a case report

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Background: Neuraxial techniques are the method of choice for cesarean section (CS). During pregnancy, the risk of cephalic spread of the local anesthetic increases leading to a total spinal anesthesia. The symptoms include an ascending sympathetic, sensory and motor block with associated bradycardia, hypotension, dyspnea and loss of conscience.

Case Report: A 40-week pregnant woman, 22 years old, ASA II (gravida and smoker) admitted to the hospital for labor induction. The pregnancy went uneventful. An epidural catheter was placed with an infusion of ropivacaine with sufficient analgesic control. After ten hours, the patient began to complain of back pain with pelvic irradiation. An epidural bolus was given with ropivacaine 2mg/mL and fentanyl 50mcg, which had no effect. An urgent CS was scheduled for the indication of cephalopelvic disproportion. There was no fetal discomfort.

Under ASA standard monitoring, the epidural catheter was removed on suspicion of displacement. A spinal anesthesia was performed with hyperbaric bupivacaine 10mg, fentanyl 15mcg and morphine 80mcg that were slowly injected. The patient was placed in a supine with a slight Trendelenburg. The subsequent mean blood pressure measurements were above 65 mmHg.

The patient started with slurred speech, chest heaviness and difficulty breathing, Ventilation was assisted with 100% oxygen via facemask. There was no desaturation.

After the fetus was delivered uneventfully, a rapid induction sequence and endotracheal intubation were performed without complications. The patient remained hemodynamically stable until the end of the procedure. The patient was transferred to intensive care unit for vigilance and after 2 hours was extubated uneventfully.

Two days after, she was discharged home without any neurological or clinical sequelae.

Discussion: Respiratory distress without hemodynamic instability following spinal anesthesia is uncommon, but it should be considered.

There are case reports in the literature describing total spinal anesthesia without the ascending progression of symptoms. When recognized, supportive treatment, especially airway management, is needed until the patient regains full motor function.

References:

Cureus 15(1): e34198. doi:10.7759/cureus.34198 BMJ Publishing Group Ltd; 2021. p. A30.2-A30.

Learning points: Total spinal anesthesia could present with nontypical clinical progression. Anesthesiologists must be aware of its symptoms and act to ensure the patients safety.

21AP05-1

Successful intrapartum management of Brugada syndrome: A case of safe labor and delivery – A case report

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Background: Brugada syndrome (BS) is an autosomal dominant arrhythmic disorder characterized by an increased risk of ventricular fibrillation and sudden cardiac death in individuals with structurally normal hearts.¹

Labor and delivery in patients with this condition present unique challenges.¹²

We report a successful case of intrapartum care management in a pregnant with BS.

Case Report: A 26-year-old primigravida with BS, a positive family history, a positive ajmaline test, with an implantable cardioverter-defibrillator (ICD) in place and a negative genetic test. She has a history of cardioinhibitory reflex syncope's, but her pregnancy was uneventful.

A pre-anesthetic consultation was held to discuss the risks and potential adverse effects of her condition. At 39 weeks and 4 days of gestation, she presented to the obstetrics department in spontaneous labor.

Epidural analgesia was administered, and the patient was continuously monitored with ECG, oxygen saturation, and noninvasive blood pressure. An initial dose of 5mL of 2% lidocaine with 10mcg of sufentanyl was given without any changes in ECG, heart rate, or blood pressure. Labor progressed favorably, requiring three additional doses of 10mL of 0.1% ropivacaine at ~1-h intervals.

A healthy male neonate was delivered spontaneously 3h after the initiation of epidural analgesia. No hypotension or cardiac arrhythmias were observed during labor.

In accordance with institutional protocol, the patient was monitored for 24h postpartum in the high-care unit, where no arrhythmic events were recorded.

Discussion: BS presents unique challenges during labor, and delivery, primarily due to the increased risk of arrhythmias and sudden cardiac death. In this case, epidural analgesia was effectively used without triggering arrhythmic events, demonstrating its safety for patients with this condition.

References:

1. Thornton, P., & Radwan, M. (2020). A Rare Case of Brugada Syndrome of a Female Patient Presented for Labour: Structured Anesthetic and Analgesic Plan for Delivery Management, 6(2), 20–22. https://doi.org/10.13107/jaccr.2020.v06i02.151
2. Hong, Y., Milone, F., Hanhan, J., File, B., & Hameed, B. (2023). Intrapartum Management in Maternal Brugada Syndrome. *JACC Case Reports*, 27, 102105. https://doi.org/10.1016/j. jaccas.2023.102105

Learning points: This case highlights a multidisciplinary approach to intrapartum care in a patient with maternal BS, emphasizing tailored strategies to ensure maternal and fetal safety.

21AP05-2

Cesarean section anesthesia management under thromboelastography in a patient with Glanzmann thrombasthenia

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Background: Glanzmann thrombasthenia (GT) is a rare autosomal recessive bleeding disorder characterised by platelet aggregation disorder (1).

We aimed to share the anaesthetic management of a pregnant woman with a known diagnosis of GT with thromboelastography (TEG) guided cesarean section.

Case Report: Known diagnosis of GT and a 38 week pregnant patient with a was planned to be delivered by cesarean section. The patient had massive haematuria, gingival bleeding and haemoptysis. Laboratory parameters were Hg 11 and Plt, INR, aPTZ, PZ, fibrinogen were normal. The patient received intravenous (IV) 1 g Tranexamic acid 6 hours before surgery.

After 2 units of apheresis platelet suspension replacement, TEG was performed because spontaneous bleeding continued. In the TEG evaluation, 90 mcg/kg recombinant factor VIIa (rFVIIa) was administered to the patient in whom hypocoagulation was domi-

Afterwards, the test was repeated and TEG parameters were shown to improve. Intraoperative haemodynamics were stable and no need for blood replacement was observed.

Discussion: The basic feature of GT is the inability of platelets to bind to fibrinogen and aggregate with each other. The molecular basis is abnormality of integrin αIIbβ3 (2).

Preoperative complete blood count, PZ, aPTZ, fibrinogen should be checked and the patient's bleeding history should be guestioned. A long bleeding time and absence of platelet clustering on peripheral smear suggest GT (3).

In minor surgical procedures, bleeding may be stopped with antifibrinolytic therapies; if it cannot be stopped, platelet transfusion is the treatment (4).

It is recommended to administer antifibrinolytic treatment at least 2 hours before the surgical procedure, rFVIIa 90 mcg/kg immediately before the surgical procedure, to repeat at 2-4 hour intervals in case of prolonged surgical intervention. (3,5).

References:

1. Nurden AT, Nurden P. Inherited disorders of platelets: an update. Curr Opin Hematol. 2006 May;13(3):157-62. 2. Lambert MP, Poncz M. et al Inherited Platelet Disorders. Nathan and Oski's Hematology of Infancy and Childhood. 7th edition, Saunders Elsevier, Philadelphia, 2009:1463-87 3. Tarawah A, Owaidah T, Al-Mulla N, et al. Management of Glanzmann's Thrombasthenia - Guidelines based on an expert panel consensus from gulf cooperation council countries. J Appl Hematol 2019:10:1-9

Learning points: This case demonstrated the benefit of using teg in a patient diagnosed with GT.

21AP05-3

Post-dural puncture headache versus postpartum preeclampsia: a challenging diagnosis

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Background: In the postpartum period, approximately 40% of the parturients experience postpartum headache. Some of the main risk factors for this condition are sleep deprivation, psychological stress, hormonal changes and the use of neuraxial techniques. Postpartum headache is caused by both benign and life-threatening conditions, and distinguishing between them can be challenging.1

Case Report: We present a 29-year-old on her postpartum day six, admitted to the emergency department due to orthostatic frontal headache, neck stiffness and nausea. She had a known history of accidental dural puncture with a 18-G Touhy needle during a combined spinal-epidural technique performed for cesarian delivery. She had no known history of preeclampsia during a well-monitored pregnancy, and her past medical history was unremarkable.

Upon admission, the blood pressure was 159/89 mmHg, though subsequent readings were within normal limits, appearing consistent with her pain and anxiety rather than a worrisome condi-

Neurologic exam was normal, with no visual disturbances, edema, epigastric pain, or other signs of preeclampsia. Laboratory screening was normal, except for proteinuria, which was initially overlooked in this characteristic post-dural puncture headache (PDPH) framework.

Conservative treatment for PDPH was initiated, with partial symptoms resolution. Six hours after admission she presented with a generalized tonic-clonic seizure. Eclampsia was suspected and magnesium sulphate started. She was admitted to the intensive care unit, where magnesium sulphate was maintained, and antihypertensive drugs initiated. Further laboratory and neuroimaging studies confirmed the diagnosis of eclampsia.

Over the following week, her condition improved, and she was subsequently discharged.

Discussion: Currently, regional anesthesia is the method of choice for providing analgesia/anesthesia in obstetrics. Since PDPH is a potential cause of postpartum headache, the anesthesiologists frequently manage these patients, whose symptoms may be identical to those of life-threatening conditions.1

Reference:

1. Winston AW, Norman D. Late postpartum eclampsia coincident with postdural puncture headache: a case report. AANA J. 2003 Oct;71(5):371-2.

Learning points: Anesthesiologists must be comfortable in diagnosing and managing postpartum headaches to effectively help reduce morbidity and mortality in these patients.

21AP05-4

Anesthetic management of severe postpartum hemorrhage in a high-risk pregnancy: A case of a 39-year-old female with Turner syndrome and cardiovascular abnormalities undergoing elective cesarean section

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Background: Turner syndrome (TS) is a genetic disorder characterized by the complete or partial absence of one X chromosome and frequently associated with systemic complications, particularly cardiovascular abnormalities1.

Aortic valve replacement (AVR) is often required. Pregnancy in TS patients is high-risk, requiring multidisciplinary management.

Case Report: A 39-year-old woman with TS (ASA III), bioprosthetic AVR, ascending aortic aneurysm, and recent carotid artery dissection was scheduled for elective cesarean delivery at 37 weeks' gestation.

Key concerns included maintaining hemodynamic stability while avoiding hypertensive episodes. ASA-standard monitoring was used complemented by invasive arterial pressure monitoring.

Combined spinal-epidural anesthesia using ropivacaine and sufentanil was successfully administered. Intraoperative management was complicated by uterine atony, with estimated blood loss of 2,5L. Immediate measures included fluid resuscitation, vasopressors, and uterotonics.

Massive hemorrhage protocol was activated, with tranexamic acid administration and thromboelastography to guide blood product transfusion. Hemodynamic stability was achieved without cardiovascular-related complications.

Postoperative care included close hemodynamic monitoring. Recovery was uneventful.

Discussion: Managing parturients with TS and severe cardiovascular pathology poses unique challenges. A multidisciplinary approach is essential to address increased maternal and fetal risks. including hemodynamic and obstetric complications. Anesthesia strategies must be tailored to ensure cardiovascular stability and adequate analgesia.

Combined spinal-epidural anesthesia provided effective anesthesia for cesarean delivery, stable hemodynamics and optimal perioperative pain management. Timely activation of the massive hemorrhage protocol and advanced hemostatic tools were critical in achieving a favorable outcome2.

References:

1. Bondy, C. Pregnancy and cardiovascular risk for women with Turner syndrome. Womens Health(Lond). 2014 Jul;10(4):469-76. 2.Drew,T. et al. Major obstetric haemorrhage. BJAEducation, Volume 22(6):238-244.

Learning points: TS with cardiovascular abnormalities requires tailored obstetric anesthetic management. Anticipating and promptly managing obstetric emergencies is critical in high-risk cases. Combined spinal-epidural anesthesia is a reliable approach for cesarean delivery, ensuring hemodynamic stability in patients with cardiovascular risk.

21AP05-5

Severe preeclampsia complicated by HELLP syndrome: a case report

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Background: HELLP syndrome is a rare but severe complication of preeclampsia, with a prevalence of 0.1%-1%. Hepatic bleeding and subcapsular hematomas are infrequent, occurring in 0.9%-1.6%. The syndrome is characterized by hemolysis, elevated liver enzymes, and thrombocytopenia.

Case Report: We present a 35-year-old woman with mild asthma. diagnosed with severe preeclampsia during delivery after regular prenatal care. She presented with systolic blood pressure (SBP) >180 mmHg, headache, and epigastric pain, which resolved with analgesia.

Delivery proceeded without complications, and post-delivery, she was admitted to the ICU for management of severe preeclampsia. She was treated with magnesium sulfate and antihypertensive agents. Due to her asthma, labetalol was avoided.

After a sudden BP increase, she developed intense epigastric pain and a drop in BP to 70/40 mmHg, with anemia and a hemoglobin level of 6.8 g/dl. Urgent CT angiography revealed hepatic bleeding in segment VII, subcapsular hematoma, hemoperitoneum, and infarction in the right hepatic lobe.

She was transfused with packed red blood cells (PRBC) and fibrinogen, and embolization was performed. After the procedure, she remained stable, with blood pressure controlled with hydralazine and amlodipine.

Follow-up Doppler ultrasound and CT angiography showed no new bleeding, thrombosis or new infarct areas. Transaminases peaked at 3900 IU/L for ALT and 3500 IU/L for AST, with thrombocytopenia (platelets 50,000) and intravascular hemolysis (LDH 1500 IU/L).

These findings confirmed HELLP syndrome. After one week in the ICU, she was discharged with normalized lab values.

Discussion: HELLP syndrome is a rare but life-threatening complication of severe preeclampsia, marked by liver damage, hemolysis, and thrombocytopenia. Hepatic bleeding and subcapsular hematoma are rare but can be devastating.

Patients with severe epigastric pain or abdominal discomfort should be monitored for liver involvement. Advances in interventional procedures, like embolization, offer effective treatment.

References:

- 1. Norwitz MD PhD MBA E. Preeclampsia: Intrapartum and postpartum management and long-term prognosis
- 2. Sibai BM. HELLP syndrome (hemolysis, elevated liver enzymes, and low platelets)

Learning points: Subcapsular hematoma is a very rare complication of HELLP syndrome. Early diagnosis and timely intervention are crucial for improving outcomes. Embolization is a highly effective therapeutic alternative.

21AP05-6

Breaking new ground: Safe cesarean delivery anesthesia in a patient with Fanconi-Bickel syndrome

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Background: Fanconi-Bickel Syndrome (FBS) is a rare autosomal recessive disorder caused by GLUT2 gene mutations, impairing glucose transport. It manifests as hepatorenal glycogen accumulation, proximal renal tubular dysfunction, rickets, osteoporosis, and severe short stature. Reports on reproductive outcomes in FBS are scarce, with only two documented successful pregnan-

This case uniquely describes a tailored anesthetic strategy for cesarean delivery in an FBS patient, highlighting the challenges posed by short stature and associated comorbidities.

Case Report: An 18-year-old woman with FBS at 39 weeks gestation underwent cesarean delivery due to the risk of pelvic fractures. Her history included short stature (148 cm) and multiple renal dysfunction markers - glycosuria, proteinuria, aminoaciduria, hypercalciuria, and hypouricemia - without metabolic acidosis. A spinal anesthetic approach was chosen, using 8 mg of intrathecal hyperbaric bupivacaine, 2.5 mcg of sufentanil, and 100 mcg of morphine.

The surgery proceeded uneventfully with stable hemodynamics, minimal blood loss, and no complications during or after the procedure. The patient's recovery was smooth, meeting discharge criteria promptly.

Discussion: Managing cesarean delivery in FBS patients is complex, requiring strategies tailored to short stature and low prepregnancy BMI. Neuraxial anesthesia was preferred for its benefits, including reduced blood loss, superior postoperative pain control, and immediate maternal-infant bonding.

A reduced spinal dose accounted for anatomical factors like short vertebral column length and abdominal girth, mitigating risks of high spinal block. Intrathecal sufentanil and morphine were administered effectively without respiratory depression during hospitalization. General anesthesia was considered but avoided due to the patient's normal airway and preference for neuraxial techniques.

Due to the scarce clinical data, this case may contribute as a framework for managing similar patients, showcasing how individualized anesthetic plans can achieve successful outcomes even in challenging clinical scenarios.

Reference:

DeLeon AM, Gaiha RD, Peralta FM. The successful Anesthetic Management of a cesarean delivery in a patient with Fanconi-Bickel Syndrome. Case Rep Anesthesiol. 2022;

Learning points: Safety of Neuraxial Anesthesia; Team-Based Multidisciplinary Approach; Valuable framework for anesthetic management in FBS

21AP05-7

Respiratory distress due to "anesthesia mumps" after emergency cesarean delivery under spinal anesthesia: a case report

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Background: General anesthesia due to factors like dehydration and prolonged intubation, is more often associated with "Anesthesia Mumps", but this condition following spinal anesthesia is rare. Risk factors such as inadequate hydration and underlying patient comorbidities may contribute to its occurrence in the obstetric population.

Case Report: We present a case of acute parotitis in a 44-yearold woman following an emergency cesarean section performed under spinal anesthesia. The patient, gravida 2, para 1, with a twin pregnancy at 33 weeks and 5 days, had a history of a previous cesarean section and four failed in vitro fertilization (IVF) attempts. An emergency cesarean section was indicated. Postoperatively, the patient developed acute swollen parotid gland, presenting with painful bilateral parotid swelling, this condition causes stress, mouth opening problems and respiratory distress with a drop in SpO2.



Discussion: While spinal anesthesia is less commonly associated with parotitis, this case highlights the importance of adequate perioperative hydration and vigilance in managing high-risk obstetric patients.

Additionally, rare complications such as respiratory distress underscore the need for prompt diagnosis and treatment.

References:

1. Jarrar S, Altamimi S, Damrah S. Acute Post-operative Transient Sialadenitis "Anesthesia Mumps" After Caesarean Section Under Spinal Anesthesia: A Case Report. Cureus. 2023 Sep 4;15(9):e44635. doi: 10.7759/cureus.44635. PMID: 37671075; PMCID: PMC10476145.

- 2. Günaydın B, Bağcaz S, İnan G, Tekin E, Karcaaltıncaba D. Postoperative Acute Parotitis After Cesarean Delivery Under Spinal Anaesthesia, Turk J Anaesthesiol Reanim, 2021 Apr;49(2):159-162. doi: 10.5152/TJAR.2020.405. Epub 2020 Jun 12. PMID
- 3. Jafra A, Arora S, Dwivedi D. Benign swelling of submandibular glands under general anaesthesia "anaesthesia mumps". J Clin Anesth. 2016:34:325-6.

Learning points:

- 1. Acute parotitis can occur even after spinal anesthesia, though it is rare.
- 2. Life threating respiratory distress can emerge and its need special attention.
- 3. Adequate perioperative hydration is critical in preventing complications like parotitis.

21AP05-8

HELLP syndrome in the context of massive postpartum hemorrhage: where every minute counts

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Background: This work emphasizes the importance of timely intervention in pregnant women at risk of postpartum hemorrhage (PPH), a leading cause of maternal mortality. Women with risk factors like preeclampsia, HELLP syndrome, or placenta previa are particularly vulnerable. Early identification during prenatal care allows for planned delivery in specialized centers. Swift action protects mothers from long-term consequences and enhances recovery, making prevention and management key in this obstetric emergency.

Case Report: 33-year-old primigravida after in vitro fertilization with egg donation. The patient has gestational hypertension and antiphospholipid syndrome (diagnosed due to recurrent miscarriages, treated with LMWH and ASA).

A third-trimester screening indicated high risk for preeclampsia, which was diagnosed based on positive proteinuria (protein/creatinine ratio of 0.32 mg/mg). She was admitted for a scheduled induction of labor due to SGA. After a spontaneous vaginal delivery, manual removal of the placenta was required. Subsequently, moderate vaginal bleeding escalated into massive obstetric hemorrhage.

The hospital's emergency response protocol was activated to save the patient's life and manage hemorrhagic shock (with hemoglobin dropping from 13 to 6.9). Initial stabilization included intubation, massive transfusion, administration of tranexamic acid, fibrinogen, uterotonics, and placement of a Bakri balloon, guided by blood gas analysis and Quantra.

The patient was transferred to the Intensive Care Unit. There, our patient developed HELLP syndrome in the first hours of admission (platelets 25,000/µL, AST 75 U/L, LDH 622 U/L, total bilirubin 1.27 mg/dL).

Treatment with labetalol and magnesium sulfate was initiated. PO-CUS and a CT were performed. After detecting a large amount of free fluid in the abdomen, an embolization of the arterial branches of the deep femoral arteries was carried out.

Discussion: According to literature, PPH in high-risk pregnancies requires rapid and coordinated management. Prompt identification of risk factors allows for timely interventions, such as uterotonics, blood transfusion, fluid resuscitation and multidisciplinary treatment, which are vital to preventing complications such as hypovolemic shock, CID, and multi-organ failure, which can lead to maternal death.

Reference:

Escobar MF, Nassar AH, Theron G, et al. FIGO recommendations on the management of postpartum hemorrhage 2022. Int J Gynaecol Obstet. 2022.

21AP05-9

Urgent cesarean anesthetic management in a pre-eclamptic patient with new-onset neurological symptoms: balancing the risks of regional vs. general anesthesia

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Background: Bell's palsy (BP) is a rare condition, but its incidence increases in the obstetric population, especially associated with hypertensive states of pregnancy such as preeclampsia (PE) and studies suggest that BP increases the severity of PE.

Neuraxial anaesthesia (NA) remains the technique of choice for the majority of c-sections (CS) because of its multiple benefits. Despite that, in parturients with intracranial lesions or suspected intracranial hypertension (ICHT), the theoretical risk of herniation due to dural puncture is cited as a contraindication to NA.

In preeclamptic patients, the presence of headache and facial paralysis (FP) further complicates the decision-making process, as both symptoms could indicate ICHT or simply be part of clinical presentation of PE.

There are no clinical guidelines that address the safety of performing NA in the presence of de novo neurologic focality related to PE. The objective of this case report is to highlight the need to develop clinical guidelines that address the anesthetic management (AM) of obstetric patients with new-onset neurologic focality in the context of PE.

Case Report: A 32-year-old primiparous woman at 36.6 weeks of gestation was admitted for PE with occipital and retroorbital headaches, scapulohumeral pain, and new-onset facial paralysis (FP). Neurological exam revealed right facial hemihypoesthesia and hemiparesis, labial commissure deviation, and eyelid weakness with preserved ocular occlusion. Long-tract involvement and nuchal rigidity were ruled out.

Due to suspected worsening clinical condition and the need for rapid delivery, an urgent c-section was indicated. Given stable hemodynamics, intradural spinal anesthesia was chosen. Postoperatively, MRI showed demyelinating lesions in the callosal-septal interface and right corona radiata, likely unrelated to current symptoms.

Discussion: AM in patients with PE and acute neurological symptoms presume significant challenges. Although guidelines suggest avoiding NA in the presence of signs of ICHT, PE headache, as well as FP, can confuse the clinical picture, leading to controversy over the use of GA or NA in the anesthetic management of CS. GA avoids risk of brain herniation, but NA avoids general anaesthesia's complications.

Learning points: AM guidelines for urgent CS in patients with PE and neurological symptoms.

Reference:

Amritraj, N., et al. (2018). Anesthesia for CS in PE patients: A review. Journal of Clinical Anesthesia. 52.

21AP05-12

Comparison of standard versus walking epidural anesthesia: clinical implications for labor pain management. A prospective cohort study

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Background and Goal of Study: Epidural anesthesia is the gold standard for labor pain management, offering analgesia while reducing discomfort. Recent advancements have prioritized minimizing motor blockade, aligning with the demand for walking epidural. These techniques utilize low concentrations of local anesthetics combined with opioids to balance analgesia and functional preservation. This study evaluates the analgesic effectiveness, motor blockade, and maternal satisfaction of standard epidural versus walking epidural.

Materials and Methods: This prospective, blind cohort, observational study included 90 laboring parturients, divided into three groups: 30 received standard epidural (SE) anesthesia (levobupivacaine 0.125% + 1 mcg/ml fentanyl or ropivacaine 0.15% + 1mcg/ ml of fentanyl), while 60 received walking epidural (WE) anesthesia (30 with levobupivacaine 0.0625% + fentanyl 2 mcg/mL, and 30 with ropivacaine 0.075% + fentanyl 2 mcg/mL). We received approval from our local Ethical Committee (74/21). All participants provided written informed consent. Epidural infusions were standardized based on patient height. Pain (VAS), motor blockade, and satisfaction (10-point scale) were assessed.

Results and Discussion: After 2 hours, patients who received SE showed a mean VAS of 0.3 [0.0 to 1.0] vs 2.0 [1.0 to 3.5] (p < 0.01) in patients who received WE. Patients who received SE showed a punctuation in Bromage scale after 2 hours of 0.0 [0.0 to 1.0] vs 0.0 [0.0 to 0.0] (p = 0.01) in patients who received WE. Patients who received SE scored a mean satisfaction index of 10.0 [10.0 to 10.0] versus 9.0 [8.0 to 10.0] (P < 0.01) in those who received WE. SE group required 0.3 rescue bolus per hour [0.1 - 0.6] versus 0.3 rescue bolus per hour [0.2 to 0.5] (P = 0.94) in the WE group. SE provided more analgesia and satisfaction compared to WE. Motor blockade observed with both techniques suggests WE remains a viable option for those prioritizing mobility. Hence, it is reasonable to tailor anesthesia choices to individual patient preferences and clinical contexts.

Conclusion: SE anesthesia offers superior analgesia and slightly higher satisfaction compared to WE, albeit with reduced mobility. Both techniques are safe and effective. These findings support individualized anesthesia choices, balancing the desire for mobility with the need for optimal pain relief.

Reference:

Hawkins JL. Epidural analgesia for labor and delivery.

N Engl J Med. 2010 Apr 22;362(16):1503-10.

21AP06-1

Unusual epidural catheter knot during its removal

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Background: Epidural analgesia for vaginal delivery is considered the gold standard today. It is regarded as a safe procedure, with contraindications including patient refusal, infection at the puncture site, and coagulopathies.

While the complications of epidural analgesia are well-documented, our case is unique and has not been previously reported in

Case Report: A 29-year-old woman in her first pregnancy was admitted to the hospital for labor. The anesthesiologist was called to administer an epidural for analgesia during the planned vaginal delivery. The epidural catheter was inserted without complications, and its correct placement was confirmed by administering three doses of ropivacaine/sufentanil over 8 hours until the patient delivered.

Several hours after delivery, the anesthesiologist was requested to remove the catheter. During the removal, resistance was encountered, and the catheter could not be easily withdrawn.

After applying slight force, the catheter was successfully removed, and it was found to be fully intact. Upon inspection, an unusual eight-loop knot was discovered in the catheter.

Discussion: Epidural analgesia is currently the method of choice for pain relief during vaginal delivery. Several technical and physiological changes in pregnant women, such as obesity, obscured anatomical landmarks, a tendency for higher blocks, and the need for smaller volumes of local anesthetics, can complicate the pro-

In our case, the epidural procedure was uneventful, and an eightloop knot in the catheter was only discovered during removal. It is possible that the catheter took an unusual path through the tissues, with the knot forming at the outset and tightening during its removal. We wish to share these intriguing photos with our colleagues to highlight this unusual complication.

References:

1. Halliday L, Nelson SM, Kearns RJ. Epidural analgesia in labor: A narrative review. Int J Gynaecol Obstet. 2022;159(2):356-364. 2. Callahan EC, Lee W, Aleshi P, George RB. Modern labor epidural analgesia: implications for labor outcomes and maternal-fetal health. Am J Obstet Gynecol. 2023;228(5S):S1260-S1269.

Learning Points:

- 1. Epidural analgesia is a safe procedure and is considered the gold standard for pain relief during normal delivery.
- 2. Epidural aids in facilitating the normal delivery process.
- 3. The anesthesiologist in charge must be vigilant and evaluate every step carefully.

21AP06-2

Cesarian section in pregnant woman suffering from idiopathic spinal cord ischemia

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Background: Pregnant women have different pathophysiological changes, and often current diseases. We present a rare case of a pregnant women suffering from spinal tumor diagnosed during her second pregnancy. The progressive neurological deficit makes inevitable the tumor removal in the 29-th week of preg-

Case Report: A 21-year-old pregnant women was diagnosed in the 29-th week of pregnancy of spinal tumor based on her clinical signs (backache, and progressive neurological deficit of her legs) and on IMR examination.

These examinations revealed a spinal tumor on TH10-L1 level. The progressive motor deficit of her legs makes the surgery inevitable. A multidimensional team (obstetrician, neonatologists, anesthetists, and neurosurgeons) consulted the patient, concluding of neurosurgical approach and strict fetal monitoring in perioperative period.

This conclusion was appreciated by the women which did not permit to deliver the baby prior of term. Betamethasone, nifedipine, and magnesium sulfate) were started. Careful positioning of pregnant women in prone position was realized. Fetus monitoring was perioperatively realized taking care of maintaining fetal heart rate over 120.

The procedure was uneventful, and the women discharged from hospital without deficits and normal pregnancy course.

Discussion: This rare case presents an unusual situation of a pregnant women undergoing non-obstetrical surgery. Being in 29th week of pregnancy minimize the risk of anesthetic effects on organogenesis, and the anesthesiologist must take care about fetal monitoring, maternal hemodynamic, and tocolysis.

Keyword: Pregnancy, neurosurgery, spinal tumor

- 1. Qaiser R, Black P. Neurosurgery in pregnancy. Semin Nurol 2007; 27(5): 476-481
- 2. Yimeng X, Xin M, Griffits B, Yan L. Medicine 2018; 97(37): pe 12360

21AP06-3

Case report of atypical eclampsia with progression to PRES

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Background: Posterior reversible encephalopathy syndrome (PRES) is a neuro-radiological syndrome characterized by transient brain dysfunction (headache, seizures, visual disturbances), often associated with reversible subcortical vasogenic edema. primarily affecting the parieto-occipital regions of the brain. This condition can be associated with hypertensive disorders, including eclampsia during pregnancy. PRES can occur even in the absence of prior hypertensive disorders during pregnancy, presenting as an atypical eclamptic crisis which poses a diagnostic and management challenge.

Case Report: A 30 year old primigravida, 40 weeks of gestation presented in the hospital for labor and delivery, no prior history of hypertensive disorders during pregnancy. Three hours after admission she complains of a headache, her blood pressure is measured at 127/85 mmHg, an increase of 20% from her baseline blood pressure.

During labor, twelve hours since admission she experienced a sudden onset of a generalized seizure. She was urgently taken to the operating room for an emergency cesarean section under general anesthesia to ensure maternal and fetal safety.

During emergence from anesthesia, she had a second seizure, prompting the administration of magnesium sulfate and a request for a neurology consultation and imaging evaluation. Imaging studies, including computed tomography (CT) and magnetic resonance imaging (MRI) of the brain, revealed findings consistent with PRES. She also required postoperative antihypertensive treatment with methyldopa and nifedipine. She was discharged after 15 days with no neurological deficits.

Discussion: This case highlights the need for heightened awareness of atypical presentations of eclampsia, particularly when neurological symptoms such as seizures occur without overt hypertension. Early recognition and timely management are crucial to prevent complications and ensure optimal maternal and fetal outcomes.

Reference:

Anant Parasher, Rajat Jhamb. Posterior reversible encephalopathy syndrome (PRES): presentation, diagnosis and treatment. Postgraduate Medical Journal, Volume 96, Issue 1140, October 2020

Learning Points: Blood pressure in pregnant patients during hospitalization should be compared with their baseline values. An increase of 20% may warrant closer monitoring.

21AP06-4

Machine learning approach to predict postoperative pain after spinal morphine administration in caesarean delivery

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Background and Goal of Study: Current pain service workflow and electronic medical records do not allow clinicians to risk stratify women with significant pain in wards after caesarean delivery and may lead to delayed reviews and workflow disruption. We compared the predictive performance of six modelling techniques (ridge regression, LASSO, Elastic net, Random Forest, XGBoost, LightGBM) in predicting significant pain defined as the maximum pain score on movement of at least 3 at the 13th to 24th hour after spinal morphine administration after caesarean delivery.

Materials and Methods: This is a retrospective cohort study conducted in a specialist maternity hospital in Singapore between August 2019 and August 2022 on parturients administered postoperative spinal morphine after caesarean delivery.

The study received a waiver of consent from the SingHealth Centralised Institutional Review Board (reference number CIRB 2022/2505).

A total of 120 clinical variables were extracted from the medical records of eligible patients, with 23 further selected to enhance the accuracy of the tested algorithms. We randomly selected 80% of the patients (n = 5,248) as training cohort, followed by validation using the remaining 20% (n = 1,313).

Results and Discussion: The study cohort comprised 6,561 patients with an incidence of significant postoperative pain of 7.9%. Ridge regression demonstrated the best performance with both the full (AUC: 0.649) and selected (AUC: 0.719) feature sets.

By reducing the number of features, Ridge regression, LASSO, Elastic net, and XGBoost showed similar in AUC (0.704-0.719), sensitivity (0.644-0.695), specificity (0.644-0.705), positive predictive value (0.155-0.179), and negative predictive value (0.949-0.955) in predicting significant postoperative pain. These were attributed to the top three variables, mainly the last recorded postoperative pain score (on movement) before the prediction point, mean and standard deviation of the hourly maximum postoperative pain score (at rest) at 0th to 12th hour.

Conclusion(s): Future work will focus on prospective validation and integration into risk stratification practices for clinical practice. This will benefit caesarean patients and healthcare professionals by streamlining clinical workflows with risk stratification, enabling enhanced responses to patients at high risk of significant postoperative pain, and improving patient outcomes and experience.

21AP06-5

Incidence of Epidural-Related Maternal Fever: findings from a prospective study in a Czech **Maternity Hospital**

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Background: Although epidural-related maternal fever (ERMF) was first described in 1989, it remains controversial and its aetiology unclear. The incidence of ERMF varies widely between studies, ranging from 1.6% to 46%, but typically occurs in 15% to 25% of patients who receive an epidural during labour.

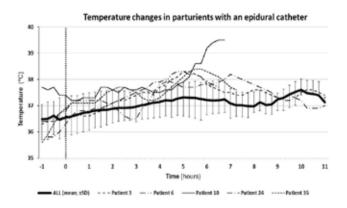
The wide variation in reported incidence may be due to differences in study design, populations studied and definitions of fever used. Data confirming ERMF come from studies on different continents, and several meta-analyses have shown that ERMF is a clinical phenomenon that is unlikely to be caused by selection bias. However, the existence of ERMF has never been recorded in Czech maternity hospitals, nor has it been studied.

Therefore, we designed a study on the occurrence of ERMF at our hospital using continuous maternal temperature monitors to exclude that it is only caused by our poor monitoring.

Materials and Methods: We performed a prospective observational study at a university obstetric department with 3800 deliveries/year and the use of epidural labour analgesia in 56% of parturients.

The aim was to determine the incidence of maternal fever (axial temperature ≥ 38°C for 1 hour or more) and to monitor temperature in labouring women with an epidural catheter. The study included 110 parturients whose temperature (T) was continuously monitored with the SteadyTemp system. Of these, 51 with epidural catheter inserted for > 3 hours were analysed.

Results: The mean T rise after catheter insertion was 0.9 ±0.7°C, with a mean pre-catheter T of 36.5 ±0.5°C and a maximum T of 37.4 ±0.6°C. Fever for more than 1 h was recorded in only 1 case (1.9%), but this was in a mother with an entry temperature of 37.7°C. Five other parturients had a short-term rise above 38°C with a spontaneous decrease in T before epidural catheter removal.



Conclusion: Our results show that, for some unknown reason. ERMF is not found in our area. The Czech population is not genetically unique to explain it in such a way, rather a different-way of delivering babies in our hospitals could be suggested. In relation to our observations, a multicentre national study is currently being drafted.

21AP06-6

Enhanced recovery after planned caesarean birth, Improved discharge rates within 36 hours after the delivery

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Background and Goal of Study: Planned Caesarean births constitute 45% of all our Caesarean births in our institution. As the pressure on the healthcare system is very high and non availability of ward beds in common, 6 years ago we introduced enhanced recovery after planned caesarean births at our institute with the aim to send women who had a planned caesarean births within 24-30 hours after the child birth (1st postoperative day). Most of our planned caesarean births were going home on the 2nd postoperative day previously.

We introduced a antenatal EROSS class to all women who were having planned caesarean births a week before their delivery and they were informed about Anaesthesia, neonatal care, breast feeding, physiotherapy and early mobility. Any questions and enquires were answered. The class was attended by an Anaesthetist, a midwife and a physiotherapist.

Materials and Methods: We analysed the data for all the caesarean births for 2 years, Jan 1st 2022 to Dec 31st 2023.

Results and Discussion: We analysed 1100 cases where data was available. The length of stay was (1-6 days) with mode 1 day. 660 women were discharged on the 1st post operative day.

Conclusion(s): After the introduction of the Enhanced recovery pathway for the planned caesarean births, we have reduced the length of stay in the hospital after planned caesarean births.

Acknowledgements: The Midwifery team and Physiotherapist at the maternity unit, Royal Alexandra hospital, Paisley.

21AP06-7

Anaesthetic considerations congenital complete heart block in pregnancy

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Background: The presence of cardiovascular disease in pregnancy has increased because of multiple factors including advanced maternal age and more women with congenital heart conditions entering childbearing years. Some of these cases might effectly be managed in distric hospitals with maternal medicine network support.

Case report: A 26-year-old primigravida presented at 37+4 weeks with reduced foetal movements. On examination, heart rate (HR) of 40bpm triggered an ECG which revealed narrow complex Complete Heart Block (CHB). Otherwise asymptomatic, she underwent exercise tollerance test which showed maximum HR achieved was 58% of the target.

A multidisciplinary team (MDT) meeting involving obstetricians, cardiologist, anaesthetists, and midwives from our regional maternal network resulted in a comprehensive care plan defining place of birth, method of delivery, equipment needed, anaesthetic management and pharmacologic consideration for both emergency and anaesthetic interventions as well as for third stage of delivery. This allowed to manage this case in our general distric hospital.

Decision was for vaginal delivery with induction of labour and Csection reserved for obstetric reasons. Patient was counselled for insertion of early labour epidural. Epidural slow top up was felt to be the safest option in case of C-section, with spinal being preferred to general anaesthetic. Cardiologists determined that temporary pacemaker insertion was not necessary before delivery.

Patient represented at 39+5 weeks in labour, she underwent an early labour epidural and she was delivered uneventfully by category 2 C-section for failure to progress with slow epidural top up and noradrenaline via peripheral infusion.

Discussion: About one third of the cases of congenital CHB remain undiscovered until adulthood and may present during pregnancy for the first time, posing unique challenges. A MDT approach and liaison with tertiary centres is imperative for successful outcomes in complex cases (1).

Reference:

1. Agarwal A, Murkey S P, Pandit P, et al. (December 23, 2023) Navigating the Complexity: A Comprehensive Review of Managing Pregnancy in Complete Heart Block Cases. Cureus 15(12): e50977

Learning points:

- · ECG during prenatal care for high-risk pregnancies
- Importance of a regional MDT network
- · Strategic use of epidural anaesthesia for stable cardiovascular function
- · Considerations for jugular venous access electively for facilitating insertion of temporary pacemaker

21AP06-8

Anaesthesia management in a pregnant woman with Brugada syndrome

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Background: Brugada syndrome (BS) is a rare heart rhythm disorder, with AD inheritance, that increases the risk of malignant arrhythmias. Due to its low prevalence and predominance in men, there is little information on anesthesic management in pregnant women, with some contradictory reports about it.

Case Report: A 36 year-old primigravida woman with asymptomatic drug-induced BS, at 39w+6d gestation, is admitted with labor in maternal ICU for monitoring. A cardiological study performed at age 13, following her father's diagnosis of BS, showed a positive pharmacological provocation test and negative electrophysiological induction study. Currently, she had baseline ECG in high leads without Brugada criteria and normal echocardiogram. A multidisciplinary team made recommendations for labor induction, analgesia and cardiac considerations, with the aim of avoiding contraindicated drugs and normothermia control. Epidural anesthesia (EA) was chosen for labor and L-bupivacaine indicated as it has reduced cardiotoxic profile.

During labor, an external defibrillator was available in the delivery room. Puncture at L3-L4 of EA was performed without incidents; test dose of 4 mL 1% lidocaine was negative. An initial bolus of Lbupivacaine 0.15% 8 mL + fentanyl 50 mcg was given, followed by perfusion of L-bupivacaine 0.0625% + fentanyl 2 mcg at 8 mL/h + PCA (patient-controlled analgesia) 6 mL (blocking time of 20

The birth ocurred spontaneuously, eutocically, with directed delivery. A grade II tears occurred, with subsequent dehiscence of the episiotomy suture that required intradural anesthesia instilling prilocaine 10 mg + fentanyl 20 mcg. The patient remained monitored 24 hrs after delivery, with defibrillator stickers placed and isoproterenol and quinidine available. Throughout the process, she remained hemodynamically stable.

Discussion: To date, in the absense of consistent clinical studies in pregnant women with BS, there is no general recommendation for anesthesia, so it is important to communicate experiences. Some local anesthesics as bupivacaine and procaine are conflicted in these patients. Our case shows the anesthesic management of a high-risk pregnant with BS, using L-bupivacaína for EA y prilocaine for intradural without complications.

References:

Minerva Anestesiol. 2019;85:173-88.

Learning Points: Pregnancy represents a risk situation in women with BS that requires special anesthetic considerations that should be familiar to the anesthetist.

21AP06-9

Anesthetic considerations in the management of anticoagulation in pregnant woman with mechanical heart valves

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Background: Currently, there is no consensus on the optimal anticoagulation (AC) strategy for pregnant women with mechanical heart valves (MHVs). Cumarin derivatives (CD) can cause embryopathies. Low molecular weight heparin (LMWH) is safer for the fetus but whether it is as effective as CD has been questioned. It is important for the anesthetist to understand the AC regimens as they have anaesthetic implications. We report our peripartum AC management in a woman with mitral MHV.

Case Report: A 26 year-old woman underwent mechanical mitral valve replacement at the age of 13. When she became pregnant her therapeutic AC with acenocumarol (A) was replaced by enoxaparin. At 16 wks of gestation she suffered a cerebral stroke, as a result of mitral valve thrombosis. Due to the difficulty in achieving therapeutic levels of enoxaparin it was decided to

A multidisciplinary team scheduled a cesarean section (CS) at 37 weeks' gestation, and made recommendations for peripartum AC. Regional anaesthesia during labor was chosen. At 35 wks, A was switched to LMWH twice daily (target anti-Xa 1-1.2 IU/mL), which was replaced by non-fractionated heparin (NFH -sodium heparin iv-) 36 hrs before CS. The infusión was stopped 6 hrs before the surgery. aTTP was analysed to ensure reversal of AC. Puncture at L4-L5 of intradural anaesthesia was performed without incidents. Intraoperative bleeding was low and a healthy baby was delivered. 6 hrs later, NFH was restarted monitorized by aTTP. On the 3rd day, the patient suffered hemodynamic instability related to bleeding in the CS area, which required urgent surgery. 2 L of hemoperitoneum were removed and the hysterorrhaphy was reinforced. Subsequentely, the evolution was favorable.

Discussion: The high thrombotic and hemorrhagic risk of pregnant women with MHVs can be reduced by a planned CS and modifying the AC regimen close to term. The main concern about regional anesthesia and AC are complications such as spinal hematoma.

In our case, due to the previous thrombotic event, CS was chosen to reduce the period without AC compared to vaginal delivery, and to facilitate the neuraxial procedure we favor AC with LMWH near the labor, switching to NFH before delivery. The risk of second surgey due to postpartum bleeding requires close monitoring of hemostasis.

References:

Br J Hosp Med. 2021;82:1-7

Learning Points: Parturients with MHVs carry a high risk of complications that require detailed planning of their peripartum AC needs

21AP06-10

Navigating Safe Anesthetic Management in a **Pregnant Woman with a Malignant Hyperthermia Diagnosis**

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Background: Malignant hyperthermia (MH) is a rare pharmacogenetic skeletal muscle disorder triggered by halogenated inhalational anesthetic agents and succinylcholine, leading to a life-threatening hypermetabolic crisis. Despite its rarity and the limited use of general anesthesia in obstetrics, recent research supports maintaining dantrolene in maternity units, as MH susceptibility during cesarean delivery (1/125,000) matches rates in non-obstetric settings.1,2

Preventing exposure to triggering agents requires meticulous perioperative planning and equipment preparation.

Case Report: A 38yo primigravid woman at 41 weeks gestation with a confirmed diagnosis of MH susceptibility underwent labor induction. Anesthesiology was consulted in advance, ensuring safety protocols were in place. The anesthesia workstation was prepared by removing vaporizers, replacing breathing circuits and soda lime canisters, and flushing the system with 100% oxygen. Dantrolene was readily available in the maternity floor.

Labor was induced with oxytocin and an epidural catheter was placed at L2-L3. Analgesia was provided using 8mL of 0.2% ropivacaine and 10mcg of sufentanil, with additional 0.2% ropivacaine boluses as needed.

After 20h of labor, due to cephalopelvic disproportion, a c-section was performed. An additional 15mL of 0.75% ropivacaine and 10mcg of sufentanil were administered. The intraoperative course was uneventful, with administration of 30mg ketorolac, 1g paracetamol, 4mg ondansetron and 25IU oxytocin. Both mother and neonate were discharged 5 days later.

Discussion: Although rare, MH is an anesthetic emergency that requires logistical readiness, including availability of dantrolene, established protocols, and trained multidisciplinary teams. Avoidance of triggering agents is imperative.

The anesthesia workstation must be fully prepared for MH-susceptible patients, even if regional anesthesia is planned, to facilitate a prompt conversion to general anesthesia if necessary.

References:

1. Larach MG et al. Succinylcholine use & dantrolene availability for MH: analysis & review. *Anesthesiology.* 2019;130:41–54.
2. Guglielminotti J et al. MH prevalence in obstetric patients, US 2003–2014. *BMC Anesthesiol.* 2020;20:19.

Learning Points: MH requires preparation in obstetric units, including dantrolene availability and trained teams. The anesthesia workstation must always be prepared for MH management, even if general anesthesia is not initially planned.

21AP06-11 PDPH and CVST - different sides of the same coin

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Background: Cerebral venous sinus thrombosis (CVST) is a rare but potentially fatal complication in the post-partum period. A recent review of 58 case reports in obstetric patients diagnosed with CVST found that 79.3% of the cases had an antecedent postdural puncture headache (PDPH) and concluded a possible association between the two. A proposed mechanism of its pathogenesis can be explained by the components of Virchow's triad.

According to this review, the most consistent and common symptom of CVST is headache (98% of cases) as it is in PDPH, which can pose a serious diagnostical challenge and delay treatment. By publishing this recent clinical case, we want to raise awareness of this association and emphasize the importance of a careful differential diagnosis of postpartum headaches.

Case Report: A 31years old patient G2P1 with a BMI-37.5 presented at 41w gestation for a vaginal delivery after a normal pregnancy. She had a past medical history of obesity and previous uncomplicated vaginal delivery with epidural anesthesia.

For the current delivery, a successful epidural catheter was placed on the second attempt after an inadvertent dural puncture during the first one. Three days after the delivery, the patient presented typical postural headache with photophobia and neck stiffness consistent with PDPH.

Following local protocols - a blood patch(BP) was performed twice, with some transient relief of the symptoms. Because of the persistent headache, the patient underwent brain MRI 24h after the second BP, which revealed thrombosis of the sagittal sinus. Anticoagulation was initiated. At 6 month follow-up, the patient was asymptomatic and the control MRI showed complete resorption.



Discussion: The post-partum period is an independent risk factor for CVT and a PDPH possibly augments the risk of this serious complication.

References: https://www.bjanaesthesia.org/action/showPdf?pii=S0007-0912%2822%2900647-X, https://pubmed.ncbi.nlm.nih.gov/34598860/

Learning Points: Women with post delivery headache should be carefully evaluated by a multidisciplinary team with a low threshold for neuroimaging, particularly if the headache persists or changes its pattern.

21AP06-12

Anticipated difficult airway and thrombocytopenia in an obstetric patient undergoing cesarean section: a case report

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Background: Anesthetic management of parturients with anticipated difficult airways is challenging due to pregnancy-related airway changes and potential for urgent cesarean sections¹.

Thrombocytopenia further complicates the choice of neuraxial anesthesia, requiring careful assessment within a clinical context. Current evidence suggests that the risk of spinal epidural hematoma with a platelet count ≥70,000/µL is likely to be very low in the obstetric patient over a range of thrombocytopenia diagnoses in the absence of other risk factors².

Case Report: A 27-year-old primigravida with trismus from multiple temporomandibular joint surgeries and thrombocytopenia (platelets ~60,000/µL) was scheduled for elective cesarean section at 34 weeks. Her medical history included congenital deafness, acute myocardial infarction, and polyvalent allergies (analgesics, soya, latex).

The patient was well known to our department, and early planning with cardiology and hematology was carried out, also in case of emergency surgery. Spinal anesthesia with 0.5% bupivacaine without morphine was administered.

A difficult airway specialist was available if general anesthesia became necessary. Surgery was uneventful, the neonate's Apgar scores were 10-10-10.

Discussion: Anesthetic planning for cesarean delivery in a patient with a difficult airway, thrombocytopenia, cardiac history, and severe allergies requires careful consideration of physiological and situational factors. Elective cesarean allowed for preparation, but emergency readiness was essential.

Due to airway management limitations - trismus, inability to use supraglottic devices, uncertain awake intubation - we preferred neuraxial anesthesia, accepting lower platelet counts as there were no bleeding symptoms present.

References:

1. Mushambi, M. C., et al. (2020). Anaesthesia, 75(7):945-961. 2. Bauer, M. E., et al. (2021). Anesthesia & Analgesia, 132(6):1531-1544.

Learning Points: In complex cases, early recognition of high-risk patients, multidisciplinary teamwork, and antenatal planning contribute to a safe outcome.

21AP07-2

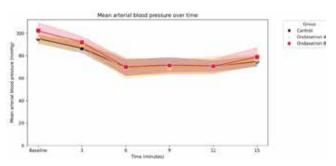
The role of ondansetron in prevention of hypotension during caesarean section under spinal anaesthesia: randomized double-blind study

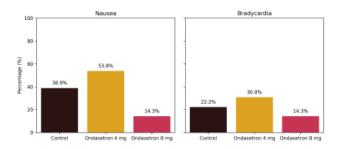
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Background and Goal of Study: Maternal hypotension is the most frequent complication of spinal anaesthesia for caesarean section (CS). Serotonin- sensitive receptors in cardiac chambers are provoked by decreased venus return during spinal anaesthesia resuting in activation of Bezold-Jarisch reflex leading to worsening of hypotension and bradycardia.

The aim of our study was to investigate the efficacy of 5-hydroxytriptamine antagonist ondansetron in maintaining maternal haemodynamic stability during spinal anaesthesia for CS.

Materials and Methods: This randomized double-blind study was conducted on 45 healthy parturients who were scheduled for elective CS under spinal anaesthesia. They were randomly assigned into three groups. Control group received saline, while experimental groups were administered ondansetron 4 mg and 8 mg respectively. All drugs were given in 10 ml syringes and the attending anaesthesiologist was unaware of syringe content. In all groups drug was given five minutes before spinal anaesthesia. The baseline mean arterial pressure (MAP) and heart rate were measured before spinal and then in three minutes interval until delivery. All participants were given metoclopramide before spinal as antiemetic prophylaxis. The overall vasopressor and atropine requirement was recorded.





Results and Discussion: Demographic characteristics were comparable. There was no significant difference between groups in terms of mean blood pressure. Moreover, the incidence of bradycardia and nausea did not reach statistical significance among groups.

Conclusion(s): Ondansetron does not affect haemodynamic parameters such as MAP and heart rate during spinal anaesthesia for CS.

Reference:

Massotha C, To"pel L, Wenk M. Hypotension after spinal anesthesia for cesarean section: how to approach the iatrogenic sympathectomy. Curr Opin Anesthesiol 2020; 33:291-298.

21AP07-3

Rosuvastatin changes the transport function of OATP2B1 across the blood-placental barrier and the placental permeability rate of remimazolam

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Background and Goal of Study: We hypothesized and verified that the interaction of drugs in combination with each other would change the transport rate by transporter on the blood-placental barrier and control the placental permeability of remimazolam (RMZ) during general anesthesia

Materials and Methods: The Organic Anion Transporting Polypeptide 2B1(OATP2B1) transports specific substances from outside to inside the cell as carriers. Using an in vitro 3D bloodplacental barrier model (Fig.A), we compared the permeability of RMZ between the single administration group of RMZ 100 nM only and the coadministration group of RMZ 100 nM and rosuvastatin. Next, we compared the amount of RMZ taken up into the HEK293 cells overexpressing OATP2B1(HEK-OATP2B1) and the HEK293 cells not expressing OATP2B1(HEK-pcDNA) upon exposure to RMZ, to evaluate the competitive inhibitory effect of the two drugs, administered with simultaneously Estrone-3-Sulfate(E3S) for the high-affinity binding site and rosuvastatin for the intermediate-affinity binding site (H579), as known sitespecific binding agents. The site within OATP2B1 transporting RMZ was identified from changes in intracellular uptake of RMZ. Statistics were analyzed using Kruskal-Wallis test for comparison between groups at each time point and within groups over time. Results and Discussion: In an in vitro 3D blood-placental bar-

rier model, the permeability rate of RMZ increased over time in the single administration group of RMZ, and decreased in the coadministration group with rosuvastatin concentrations of 10 nM (Fig.B). Uptake of RMZ into cells in HEK-OATP2B1 was not reduced in combination with E3S and was significantly decreased in combination with rosuvastatin, compared to the single administration group (Fig.D), suggesting carrier transport of RMZ via the H579 site, which is same as that of rosuvastatin.

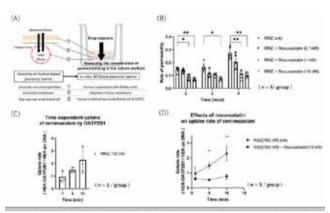


Figure. (A) Overview of the *in* rains 3D roodel. The three-layer structure is mimicked with human-derived cells similar to in vivo. (B) Permeability or RMZ 100 nM. Permeability of RMZ 100 nM increased over time in the monotherapy group and decreased in the cambination group at concentrations of rossentatin greater than 10 nM. (C) Validation of OATP2B1 mediated carrier transport of reminaculam. Reminatelam uptake increased in the REX-OATP2B1 group compared to the REX-pc DNA group. (D) Effects of the coadministration with concreatation of the transport rate of reminazulam. The uptake of syminazulam was significantly decreased in the rosservatatio group compared to the terminazulam and group.

Data are presented as error bar; mean = 58M, *p<0.05, **p<0.01. Remimazolam, RMZ.

Conclusion(s): Rosuvastatin can change the placental transfer rate of RMZ by modifying the transport rate of OATP2B1 on the blood-placental barrier.

21AP07-4

Undiagnosed placenta accreta disorder in a uterus transplanted patient presenting with a spontaneous miscarriage

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Background: Over the past 11 years uterus transplant surgery (UTx) has become a relevant, albeit rare option for patients with uterine factor infertility. The first child born to a uterus transplanted woman was in 2014 in Sweden in 2014¹, and just over 60 babies have been born via this method.

UTx consist of transplant surgery, IVF, c-section and hysterectomy (after maximum 2 children)². There are no reports of placenta accreta disorders (PAD) in these patients, but it is well known that women with previous uterine surgery have a higher incidence of this condition. Hysterectomies in UTx patients showed prolonged surgical times, typically 2-3h, but ranging up to 5 hours³.

Case report: 39 y.o. ASA 2 woman with a UTx in 2017 due to Rokitansky Sd and cervix stenosis. She had a successful pregnancy and CS in 2019 but opted out of a hysterectomy as she wished for a second pregnancy. In 2023 she underwent an uncomplicated CS at w22 due to premature delivery. In her third pregnancy she miscarried at week 18, got epidural for pain relief and the entirety of the fetus was expelled vaginally, however the placenta was retained. Upon her arrival to the OR she had bled 500 ml with minimal active bleeding. The patient wished for a hysterectomy. The primary plan was to remove the retained placenta vaginally and perform

a hysterectomy the following day when an obstetric anesthetist was on-site. After discussion with the team and taking into consideration the patient wishes she received an uncomplicated general anesthesia.

It was not possible to manually remove the placenta. A hysterectomy was performed, total surgical time of 222 min, total bleeding 1050 ml. The patient remained stable throughout. The pathological study confirmed a morbidly adherent placenta accreta, FIGO grade 1.

Discussion: This is the first case of a PAD in UTx and it is unclear what the incidence of PAD will be in this group of patients. Although neuraxial anesthesia in the first choice in patients with placental retention, the lack of an obstetric anesthesiologist and the patient wishes made the team opt for a general anesthesia.

References:

1. The Lancet 2015;385:607-16. 2.Acta Obstet Gynecol Scand 2022;101:355-63. 3. nesth Analg 2018;127:930-8

Learning points: UTx, despite uncommon, is becoming more available, and complications regarding this technique require a team management with an obstetric anesthetist to diminish maternal morbidity and mortality, providing the highest level of care.

21AP07-5

Case of successful thrombolytic therapy during cardiopulmonary resuscitation in a pregnant women with massive pulmonary embolism

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Background: It is known that 11% of maternal deaths during pregnancy are associated with pulmonary embolism (PE), but data on the use of thrombolysis in pregnant women with PE and hemodynamic instability are scarce.

Case Report: In pregnant woman H., 36 years old, 26 weeks, based on clinical of cardiopulmonary shock, D-dimers (3487 ng/ml), and bedside ultrasound examination of the heart, PE was suspected. Intensive care: NIV, dobutamine 5 mcg/kg/min and adrenaline 0.01 mcg/kg/min, morphine 1 mg, heparin: bolus 5000 U, followed by infusion of 1000 U/hour.

Against the background of spontaneous labor, circulatory arrest occurred. CPR was performed three times, each lasting 1 minute. Thrombolysis was performed 15 minutes after the onset of the first episode of asystole: alteplase 50 mg i.v. by jet stream, titrated with 50 mg at a rate of 25 mg/h, followed by heparin infusion (1000 U/h) in the postoperative period.

After 30 min., spontaneous circulation was restored, but bleeding began in a volume of 1000 ml. In order to stop the bleeding, postpartum uterine extirpation was performed against the background of an activated hemostatic resuscitation protocol under the control of a coagulogram and ROTEM.

Three hours after its implementation FIBTEM: A5=0, MCF=0; INTEM: CT=1057, FT=1577, A%=5 mm; EXTEM: CT=269, CFT=817, A5=9 mm; HEPTEM: CT=474, CFT=930, A5=18 mm.

Further correction DIC syndrome was carried out purposefully under the control of ROTEM. The increase in the D-dimer level to 58125 ng/ml served as an additional laboratory marker of the

effectiveness of thrombolysis. The total volume of blood loss was 3100 ml. In the postoperative period, the volume of infusion-transfusion therapy was 6940 ml. 24 hours, a complete absence of neurological deficit was recorded and extubation was performed. CT with contrast was performed, massive pulmonary embolism with 60% lung involvement was established.

Discussion: The use of thrombolytic therapy during labor, on the one hand, is contraindicated, on the other hand, it is the only effective method of saving pulmonary embolism: the number of reports on thrombolytic therapy for massive PE in pregnant women is extremely small.

Learning Points: Thrombolytic therapy provides excellent effect in case of circulatory arrest caused by PE in obstetric patients. It is advisable to manage hemocoagulation after thrombolytic therapy for PE with subsequent bleeding in pregnant women not only using standard tests, but also using ROTEM.

21AP07-6

Managing pregnancy with severe mitral regurgitation: insights into anesthetic and postpartum strategies

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Background: Valvular heart disease during pregnancy poses significant risks to both the mother and fetus. Multidisciplinary care is essential for optimizing outcomes, which includes accurate diagnosis, evaluation of severity, and management during pregnancy, labor, and postpartum1.

Limited evidence-based guidelines reflect the need for individualized care.

Case Report: 40-year-old pregnant woman (3G2P) at 27 weeks of gestation, former drug addict presented in the ER with exertional dyspnea for 2 months. Her first two pregnancies were uneventful and had no history of cardiac diseases.

She was diagnosed with severe mitral regurgitation and pulmonary hypertension complicated by a respiratory infection that precipitated decompensated heart failure. She was stabilized in the ICU, and scheduled for an elective c-section at 30 weeks.

Epidural anesthesia was selected using 10mcg sufentanyl and incremental doses of ropivacaine 0.75% and lidocaine 2% to achieve T4 sensitive block, guided by invasive arterial monitoring. The cesarean delivery was uneventful, and both the mother and newborn were admitted postoperatively to the ICU and neonatal unit, respectively.

There were no complications, and both were discharged in stable condition, with the patient scheduled for mitral valve replacement postpartum.

Discussion: Cardiac diseases remain a leading cause of maternal mortality due to hemodynamic changes of pregnancy and postpartum².

Epidural anesthesia with incremental boluses of local anesthetics allowed precise level of sensitive block and hemodynamic control during cesarean delivery.

Postpartum care was critical, as rapid hemodynamic shifts increased cardiac stress. Intensive monitoring during the first 72 hours ensured tight surveillance, enabling a stable recovery without complications.

References:

1. Van Berendoncks A, McGhie J, Heidbuchel H. Repetitive out of hospital cardiac arrests following pregnancy: A case report (...). Eur Heart J Case Rep.

2. Chauhan G, Tadi P. Physiology, Postpartum Changes. https://www.ncbi.nlm.nih.gov/books/NBK555904

Learning Points: Multidisciplinary care is critical in managing valvular heart disease in pregnancy. Early diagnosis, symptom control, and strategic delivery planning are key to achieve favorable maternal and fetal outcomes. Individualized anesthetic plans, such as epidural techniques, provide hemodynamic control during delivery, and intensive postpartum monitoring mitigates risks associated with rapid hemodynamic changes.

21AP07-7

Enhancing epidural analgesia: a technical overview of the dural puncture epidural technique

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Background and Goal of Study: The dural puncture epidural (DPE) technique has gained attention as an alternative to standard epidural analgesia. By using a spinal needle to create a dural perforation without intrathecal drug injection, DPE enhances cerebrospinal fluid (CSF) exchange and promotes the spread of epidural medication, improving analgesic efficacy.

Here, we aim to review and summarize the procedural aspects and clinical outcomes associated with DPE.

Materials and Methods: A literature review was conducted using PubMed and Google Scholar to evaluate DPE compared to traditional epidural and combined spinal-epidural (CSE) techniques. We focused on analgesic onset, sacral nerve block quality, patient outcomes, and procedural complications.

Results and Discussion: DPE improves analgesic onset and sacral nerve coverage while mitigating risks such as fetal bradycardia and profound hypotension, often seen with CSE. Factors influencing its efficacy include needle gauge, local anesthetic selection, and patient positioning.

Despite these benefits, procedural challenges such as accidental dural puncture and post-dural puncture headache necessitate standardized protocols to optimize its safety and effectiveness.

Conclusion(s): DPE offers improved block quality and safety over epidural while avoiding the hemodynamic instability and fetal risks associated with CSE.

Further studies should focus on optimizing its procedural protocols and exploring its broader applications beyond obstetric anesthesia.

21AP07-8

Insights into postpartum haemorrhage cause and management in an Albanian University hospital

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Background and goal of the study: Postpartum haemorrhage (PPH) continues to be the leading preventable cause of maternal illness and deaths globally, accounting for 8%-20% of maternal deaths. The study aims to identify the cause of postpartum haemorrhage regarding the time and modes of delivery and their

Materials and methods: A prospective study in healthy pregnant women ASA II, admitted during 2023-2024, in UHOG "Koço Gliozheni". The study enrolled patients who had blood loss ≥ 1000 ml or that was accompanied by signs or symptoms of hypovolemia, occurring within 24 h after birth, regardless of the mode of delivery. The volumetric, gravimetric and area methods were combined to assess the PPH amount quantitatively.

Exclusion criteria: women with renal and hepatic insufficiency, hematologic disease, gestational age < 26 weeks. SPPS 20 was used for statistical analysis.

Results and discussion: 159 patients with a mean age of 31 years, 28-42 weeks of gestation, had PPH.The most common cause of PPH was uterine atony in 44.7%, followed by placental factors in 42.8%. The haemoglobin before was 11.06 mg/dL and after PPH 7.41 mg/dL.

In term delivery, the most common causes of postpartum haemorrhage were uterine atony (55.55%) and the retained placenta (11.96), while in preterm delivery, placental abruption and placenta previa (33.33% each). Patients with placenta percreta had the more significant blood loss and consequently, the highest number of transfused blood units, followed by uterine dehiscence, retained placenta and uterine atony.

The estimated blood loss was more significant in MP than in PP and, according to the time of delivery, in term delivery than in preterm delivery. There was no significant difference in blood loss according to the mode of delivery or type of anaesthesia used.

Conclusions: Uterine atony and placental factors remain the most common causes of postpartum haemorrhage. The management of PPH is still a challenge and needs close patient monitoring, early intervention and the collaboration of the professional team.

References:

- 1. Bienstock JL, Eke AC, Hueppchen NA. Postpartum Hemorrhage. N Engl J Med. 2021 Apr 29;384(17):1635-1645. doi: 10.1056/NEJMra1513247. PMID: 33913640; PMCID: PMC10181876
- 2. Borovac-Pinheiro A, Pacagnella RC, Cecatti JG, et al. Postpartum hemorrhage: new insights for definition and diagnosis. Am J Obstet Gynecol 2018;219:162-8. [DOI] [PubMed] [Google Scholar]

21AP07-9

Midwives experience with and subjective impressions of spinal analgesia for vaginal delivery, a single centre survey study

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Background and Goal of Study: Sweden has approximately 100 000 deliveries per year and 1-3% of the patients (mostly multiparous women) get a delivery spinal (DSPA). To study the opinion of the MW regarding DSPA and relate it to their experience, we conducted a survey at our tertiary centre, performing about 4000 deliveries annualv1.

Materials and Methods: An anonymous survey was distributed among MW working at the delivery unit during a 3-week period. It included questions on their professional background, their beliefs regarding pain relief and negative effects of DSPA, their comparison with epidural analgesia (EDA), complications and examples of different clinical scenarios. Statistics was computed with PSPP. Chi2-test was used for comparison between groups, p≤0,05 was considered significant.

Results and Discussion: 38/45 MW answered the survey. They were split into two groups: 16/38 with <6 years of experience and 22/38 with ≥6 years of experience. 9/38 have worked at least at two delivery units. 19/38 have managed ≤5 patients with DSPA, 19/38 had experience of ≥6 DSPA. 24/38 considered DSPA to be technically easier than EDA. DSPA was considered very effective by 29/38, effective by 8/38 and moderately effective by 1/38.

A positive opinion regarding efficacy of DSPA was related to MW's greater experience as expressed both in years of experience and as number of managed DSPA (p=0,005 and p=0,027, respectively). The positive association might be related to a calmer situation in the delivery room due to greater experience.

Regarding clinical scenarios, the majority of the MW's considered DSPA preferable in multipara with a cervix opening of ≥8 cm and when the fetus was at the spinae level. All MW considered EDA preferable in primipara, regardless of cervix dilation and fetal position.

Adverse situations mentioned with DSPA included: poor pain relief, uterine hypertonus, fetal bradycardia, delayed labor, affected motor skills in the mother and need for episiotomy. Several MW had concerns regarding limited duration of DSPA effect, resulting in a need for speeding up delivery.

Conclusions: MW with greater experience tended to consider DSPA to be more effective. Some survey answers expressed fears that DSPA would increase the risk of episiotomy and other adverse effects not supported by scientific knowledge.

References:

1. Annual report 2023 of the Swedish Pregnancy Register (www. graviditetsregistret.se)

The Obstetric Patient 249

21AP07-10

Anaesthetic management of a parturient with hypertrophic cardiomyopathy: a case report of two gestations and respective deliveries

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Background: Hypertrophic cardiomyopathy (HCM) is an autosomal dominant genetic disorder characterized by asymmetric hypertrophy of the interventricular septum causing intermittent obstruction of the left ventricular outflow tract (LVOT). During pregnancy, the risk of decompensation depends on the severity of the outflow tract obstruction and ventricular dysfunction or presence of symptomatic arrhythmias. Therefore, affected patients should be managed by a multidisciplinary team.

This case report presents the anaesthetic plan of two labours of a parturient with HCM.

Case report: A 39-year-old patient presented for induced vaginal delivery at 39 weeks of gestation. The patient had a history of eutocic delivery 5 years prior, under epidural analgesia, which was uneventful. The patient had since been diagnosed with HCM but had remained stable throughout the gestation.

Labor induction at 39 weeks with vaginal misoprostol, early labour analgesia and invasive hemodynamic monitoring were planned. A continuous spinal catheter was placed for labour analgesia, with a 0.1% ropivacaine infusion titrated according to effect.

At 24-hours postpartum the patient presented with post-dural puncture headache (PDPH) and was treated with an epidural blood patch. The patient and the newborn were discharged on the fourth day after delivery.

The second delivery occurred two years after the above-described case. The patient presented for induced vaginal delivery at 38 weeks and 5 days gestation. An epidural analgesia technique was chosen. Patient-controlled epidural analgesia (PCEA) was set up with an infusion of 0.1% ropivacaine and 0.25mcg/ ml sufentanil at 5ml/h and a 5ml bolus with a 30-minute lockout. Vacuum-assisted vaginal delivery occurred 10 hours after induction, with discharge on the second day after delivery.

Discussion: The optimal analgesia modality for labour in patients with HCM is unknown. CSA and conventional epidural analgesia were both effective in maintaining hemodynamic stability and provided adequate pain relief.

However, the occurrence of PDPH with CSA was a drawback and contributed to a less positive patient experience. Ropivacaine was the local anaesthetic of choice for both techniques due to its lower cardiotoxicity and ease of titration to reduce cardiovascular effects.

Reference:

Eur Heart J. 3165-3241(2018.

Learning points: CSA and conventional epidural analgesia were both effective in maintaining hemodynamic stability and controlling labor pain.

21AP07-11

Patient satisfaction with epidural compared to combined spinal - epidural analgesia during labor - retrospective observational study

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Background and Goal of Study: Epidural analgesia and combined spinal-epidural analgesia are widely used techniques in labor analgesia. This study aimed to compare patient satisfaction and side effects between epidural (E) and combined spinalepidural (CSE) analgesia during labor.

Materials and Methods: Data was collected retrospectively thorough electronic hospital medical records and interviewing the patients after delivery during their hospitalization.

The study included sixty-five patients allocated into groups: Group E (n = 24) and Group CSE (n = 41). Patient satisfaction was measured using five-point Likert scale. Pain scores were measured with visual analogue scale (VAS). Data on episodes of fetal bradycardia and Apgar scores in neonates, along with itching, postdural puncture headache (PDPH), nausea, vomiting, and pain scores in mothers, were analyzed. The Mann-Whitney U test and Chi-square test were applied where appropriate. Statistical significance was determined at a p-value threshold of 0.05.

Results and Discussion: The data on patient satisfaction showed high satisfaction that exceeded 95% in both groups (p > 0,05). Itching was reported to be higher in CSE group (70.7% vs 29.1%, p< 0.001). Pain scores were lower in CSE compared to E group (0.93±1.68 vs. 2.5±2.3; p <0.001). There were no statistically significant differences among other measured variables (PDPH, nausea and vomiting, fetal bradycardia, Apgar scores). More than 95% of patients in both groups expressed that they would opt for labor analgesia in their next delivery.

Conclusion(s): There were no significant differences in overall patient satisfaction between the groups. CSE group experienced less pain but more side effects such as itching. These findings highlight the need to balance analgesic efficacy with potential side effects when selecting the most appropriate method for labor analgesia.

21AP07-12

Streamlining category one caesarean section WHO checklist

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Background and Goal of Study: Category one (CAT1) lower segment caesarean sections (LSCS) are time critical with national guidance dictating that surgery be performed within 30 minutes of decision being made. The World Health Organisation (WHO) checklists are designed to ensure staff and patient safety however can result in delays to surgery.

The purpose of this project was to minimise time taken from decision of a CAT1 LSCS being made to KTS, whilst also ensuring patient safety. We aimed to shorten the WHO checklist process and design an abridged CAT1 LSCS checklist.

Materials and Methods: We conducted a survey with the faculty of anaesthetics and obstetrics to assess what information from the existing checklists the teams deemed was essential to be asked prior to KTS for a time critical CAT1 LSCS with the proviso that remaining questions be asked once baby delivered and mother stable.

Results and Discussion: Response rate of 19 (12 anaesthetists and 7 obstetricians). Eighty five percent believed that a shorter checklist will streamline the process whilst simultaneously preserving patient safety. The following 6 points were deemed absolutely essential to be clarified by consensus; conformation of patient details, consent (verbal or written) confirmed, allergy status, anaesthetic plan agreed, blood products available and in maternity fridge, neonatal registrar informed and resuscitaire checked.

ANSWER CHOICES	*	RESPONSES	
 So the shaulthets, muchine and modification check complaint? 		3.28%	1
 Difficult sinesy risk? 		38.8%	. 1
Antacid prophylasis gliver?		15.79%	1
Figure tales phechael?		10000%	1
 Team members introduced themselves by name and role? 		5.36%	-1
 Additional absorbit procedures plureself. 		D.00%	
 Any official or animal step\$1 		3138%	. 0
Any placental concernit?		36.32%	.1
Any insentiteits consens?		21,05%	.4
Antineira grant		5.36%	1
Any equipment lances or concerns?		0.00%	(gr
Cathebar in and drawing?		15.79%	1
Till servini?		1.00%	1
 YTE prophylazis ? 		0.00%	- 12
Configurate conduct*		3.36%	1
Total Respondence 19			

Thirty one percent felt enquiring about critical or unusual steps should be included. Further question of bladder catheterisation was added after direct discussions with obstetric safety lead. The remaining points on the check list were only deemed essential by <26% of participants. Based on these results - a new shorter check list was created. We opted to only include points where the positive response rate was >30%.

Conclusion(s): A formal CAT1 LSCS checklist would streamline the timeline from decision to operate to KTS and highlight critical information to uphold patient safety.

This allows for emergency delivery of anaesthesia, surgery and delivery of baby. Outstanding information from the WHO checklist to be collated retrospectively rather than a substitution for this information

Reference:

World Health Organization. (2008): Implementation manual: WHO surgical safety checklist (first edition):

21AP07-13

Anesthesia challenges in eclampsia: a case report

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Background: Eclampsia is a rare but life-threatening obstetric emergency requiring prompt seizure control, blood pressure stabilization, and urgent delivery. Anesthesia plays a pivotal role, with regional techniques preferred to minimize airway risks. This case highlights the challenges and crucial role of anesthesia management in eclampsia.

Case Report: 32-year-old woman, 39+1 weeks of gestation with hypertension, presented with new-onset seizures at home. On admission, she was postictal, blood pressure 169/99 mmHg, sinus tachycardia (110 bpm), peripheral oxygen saturation 94%, with bilateral lower limb edema.

Eclampsia was suspected, and magnesium sulfate (MgSO4) therapy was initiated (6g bolus plus 2g/h infusion). Labs showed hemoglobin 10.1 g/dL, platelets 161,000/µL. Another seizure occurred 20 minutes after admission, requiring diazepam (10mg) for cessation.

Another bolus of 4g MgSO4 was administered, and the infusion rate was increased to 3g/h. An urgent cesarean section under spinal anesthesia (SA) (morphine 100µg, sufentanil 2.5µg, bupivacaine 8mg) proceeded without complications. ASA monitoring, radial arterial line, oxygen therapy (2 L/min), blood typing, and two 18G intravenous accesses were established.

Multimodal analgesia (paracetamol 1g, ketorolac 30mg, ropivacaine 150mg), antiemetics (dexamethasone 8mg, ondansetron 4mg), aspiration prophylaxis (metoclopramide 10mg), and cefazolin 2g were used. Arterial blood gases showed pH 7.38, lactate

The newborn's Apgar scores were 8/9/10. Postoperatively, the patient was transferred to the intensive care unit. Her blood pressure stabilized, and no further seizures occurred.

Discussion: This case highlights the importance of MgSO4 as the cornerstone of eclampsia management to prevent recurrent seizures. Emergency cesarean section under SA, supported by comprehensive perioperative management, ensured maternal and neonatal safety. The absence of thrombocytopenia allowed the safe use of SA.

References:

1. Smith, J., et al. Anesthesia for cesarean delivery in eclampsia: A review of techniques and outcomes. Anesthesia & Analgesia. 2022;134(3):575-582

Learning Points:

- 1. Eclampsia requires immediate diagnosis and treatment with MgSO4 to prevent maternal and fetal complications.
- 2. SA is a viable option for cesarean delivery in eclamptic patients with hemodynamic stability and without thrombocytopenia.
- 3. Multidisciplinary coordination and timely intervention ensure favorable outcomes in cases of eclampsia.

21AP08-2 **High Anion Gap Metabolic Acidosis caused** by starvation ketoacidosis in pregnancy

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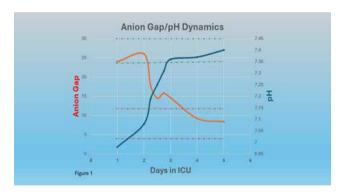
Background: Pregnancy leads to notable physiological changes, including an exaggerated fasting response due to relative insulin resistance and elevated counter-regulatory hormones like placental glucagon and lactogen. Inadequate caloric intake may trigger starvation ketoacidosis.

This report details a case where overlooked ketonuria in the 3rd trimester advanced to severe high anion gap metabolic acidosis (HAGMA), culminating in intrauterine demise (IUD).

Case report: A 33-year-old multiparous woman(36+2) presented with shortness of breath. Recent medical history: a dental abscess on antibiotics, not eating/+sleeping well. ED: markedly agitated. Afebrile. Tachypneic. Tachycardic, Hypertensive. Lab. results: Hb:15.8, WBC:28.3, Plt: 339; Creat: 67µmol/L, K:5.2mmol/L. Urinalysis: Ketones:150mg/dL, Proteins:500mg/dL. ABG: pH: 6.98, pCO2:1.52kPa, pO2:17.2kPa, BE: -28.8mmol/L, AG: 25.4mmol/L, Lactate:1.49mmol/L. Glu:4.4mmol/L. Bedside ultrasound: no foetal heartbeat. Following patient's stabilization using i.v. bicarbonate+ crystalloids+ MgSO4, an emergency C-section under GA was performed without complications.

It was revealed only after the procedure in the ICU, the patient hadn't eaten adequately for over 3 weeks, with ketonuria persisting for a similar duration.

To suppress further ketogenesis, an immediate source of glucose was administered with insulin and precautions for refeeding syndrome. The patient achieved complete homeostasis after 4 days. (Fig.1)



Discussion: After excluding pre-eclampsia and placental abruption, all potential causes of HAGMA, including intoxication, sepsis, renal failure and diabetic/starvation ketoacidosis, were considered. The most significant clue came from a thorough anamnesis, confirming long-term malnutrition. Regrettably, eminent ketonuria was already present during routine check-ups. Its oversight ultimately led to IUD.

Reference:

Abraham L.et al, Starvation Ketoacidosis in Pregnancy: An Unusual Presentation and Brief Literature Review, JCEM Case Reports, Volume 2, Issue 9, 2024.

Learning points: Early recognition and management of patients at risk of starvation ketoacidosis are crucial to ensure optimal foetal development.

21AP08-3

PCA remifentanil versus intermittent epidural boluses for labor analgesia: pain scores and patient satisfaction

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Background and Goal of Study: In labor analgesia remifentanil is becoming very popular as an alternative to epidural analgesia. In this study, we compared pain scores and patient satisfaction in different time points during labor.

Materials and Methods: We analyzed 120 patients, ASA I, admitted for spontaneous labor and divided into two groups. The first group (60 patients) received intravenous patient-controlled analgesia with remifentanil titrated from 20 mcg up to a maximum bolus dose of 50 mcg with a lockout interval of 2 minutes. The second group, epidural group (60 patients) received intermittent epidural boluses. We evaluated pain scores and patient satisfaction scores through 2 VAS scales in different time points. Oxygen saturation (SpO₂) and respiration rate were monitored continuously.

Results and Discussion: VAS pain scores were significantly higher in the remifentanil group at all time points, mean values of the VAS pain scores after onset of analgesia were 4.1±1.2 in remifentanil group, 2.3±1.1 in the epidural group (p<0.0001). On the other hand, VAS satisfaction scores did not differ between the two groups. The average VAS satisfaction score during the entire monitoring period was 9.2 ± 0.9 in the remifentanil group, and 9.3 ± 0.8 in the epidural group, without statistically significant difference between the two groups (p = 0.69). Mean VAS score after delivery was 9.68±0.5 in the remifentanil group and 9.72±0.5 in the epidural group (p=0.8).

Conclusion(s): PCA with remiferatnil is less effective for pain relief in patients during labor compared to epidural analgesia, but the satisfaction of patients is equal in both groups. It could be a viable alternative to epidural analgesia in moments when it is contraindicated, unwanted by the patient or simply unavailable. Continuous respiratory monitoring is mandatory.

Uterine rupture following medical termination in a 21-week twin pregnancy with previous cesarean sections: a case report on management and outcomes

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Background: Uterine rupture during medical termination of pregnancy is an uncommon but severe complication. This is a case of a medical interruption of a 21 weeks gestation that resulted in uterine rupture.

Case report: 41 year old female G3P1 (one prior abortion and two previous cesarean sections), presented for pregnancy termination due to Down syndrome in both fetuses. Medical induction was initiated with mifepristone, followed by hospitalization two days later due to heavy vaginal bleeding. at admission, ultrasound revealed pelvic fetal presentation with head retention and intraabdominal blood, uterine rupture was suspected.

Upon emergency arrival, the patient was hemodynamically unstable and was immediately transferred to the operating room. Due to the high suspicion of rupture, rapid sequence induction was performed, and massive hemorrhage protocol was activated due to continued blood loss and hypotension. Exploratory laparotomy confirmed rupture at the previous hysterotomy site. Resuscitation with blood products was tailored via real-time ROTEM analysis and included 6 plasma, 7 units of blood, 1 platelet pool, 6 g of fibrinogen, and 2 g of tranexamic acid. Additionally, 5 liters of crystalloids, ionic reposition and vasopressor support (ephedrine, phenylephrine, and norepinephrine) were required to stabilize the patient.

Despite uterine repair attempts, persistent hemodynamic instability prompted an emergency hysterectomy. The patient was then transferred to the ICU, and later recovered in the general ward without complications.

Discussion: The incidence of uterine rupture in pregnant patients with unscarred uterus is 0.3-0.8% for patients, increasing to 1.4% and 3.3% in patients with history of one or more C-sections. There is a higher risk of uterine rupture with medical termination in scarred uteri, particularly with the use of mifepristone. Unfortunately, at the time of this event, cell-saver with amniotic fluid filter wasn't available and was the only additional intervention that could decrease transfusional needs

References:

Heather Frey, MD, MSCI, Mark B Landon, MD. Uterine rupture: After previous cesarean birth. In: UpToDate, Connor RF (Ed), Wolters Kluwer. (Accessed on December 1, 2024.

Learning points: Uterine rupture in second-trimester medical terminations is rare but possible, especially in scarred uteri and multiple gestations. Local protocols must be in place with a trained multidisciplinary team.

21AP08-5

The long-term effects of unintentional dural puncture in obstetrics: a seven year prospective observational study

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Background: Post dural puncture headache (PDPH) is a debilitating condition that occurs following puncture of the dura. Little to no investigation has been done regarding the long-term morbidity of this condition. The widespread use of epidural analgesia for childbirth comes with a substantial incidence of unintentional dural punctures of 0.5%-1.5%. In a previous study we looked at the presence of chronic headache and backache in women 18-24 months following dural puncture and found a high incidence rate (16-23%).

In this study we examine the occurrence of chronic headache and chronic backache seven years post dural puncture, a significantly extended time period for post puncture sequelae.

Our study, and the previous one we conducted, is the first to exclude women with preexisting headaches or backaches.

Methods: 233 parturients were included in the analysis distributed across four groups: those who underwent a dural puncture and were treated conservatively, not with a blood patch (DP-no BP, n = 53), those who underwent a dural puncture treated with blood patch (DP-BP, n = 58), a control group of women without an epidural (n = 58), and a control group with uncomplicated epidural (n = 63). All women had delivered vaginally, and those with pre-existing chronic headache or backache prior to delivery were excluded from the analysis.

Results: In the DP-BP group, 12/58 (20.7%) women reported chronic headache, while 10/58 (17.2%) women in the DP-no BP group reported chronic headache. For chronic backache, 14/58 (24.1%) women in the DP-BP group and 12/58 (20.7%) in the DPno BP group reported chronic symptoms.

In comparison, no participants in the control without epidural group and 2/63 (3.2%) in the control with uncomplicated epidural group reported chronic headache. Chronic backache was reported by 7/63 (11.1%) in the uncomplicated epidural group and by 0 women in the control without epidural group. Statistical analysis revealed significant differences in the incidence of chronic headache between the groups (p = 0.0067), as well as in chronic backache (p = 0.0029). Women in the DP-BP group had lower odds of developing chronic headache and backache compared to both control groups.

Conclusion: PDPH poses long-lasting morbidity for years following dural puncture as we found a high incidence of chronic back pain and chronic headache in a seven year time-frame. Using epidural blood patch for treatment did not show a great advantage over conservative treatment.

Brain tumour during pregnancy: Clinical and surgical management of a challenging case

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Background: The incidence of brain tumours during pregnancy is slightly lower than in non-pregnant women, about 2,6 cases per 100,000¹. The resulting increase in intracranial pressure can mimic common pregnancy-related conditions like hyperemesis gravidarum, delaying its diagnosis and posing additional challenges to maternal and fetal health¹.

Case Report: We describe a case of a 19-year-old primigravida, diagnosed with persistent hyperemesis gravidarum since the first trimester. In the 3rd trimester, she developed severe nausea and vomiting associated with psychomotor impairment. A CT scan showed a right medial cerebellar tumour with a cystic component. Obstetric and fetal examinations were reassuring.

At 31 weeks and 6 days of gestation, an Ommaya chamber was implanted to drain the cystic lesion and control intracranial pressure, under general anesthesia. We used rapid sequence induction (RSI), videolaryngoscopy for tracheal intubation, and maintenance with volatile anesthetics. During the 4-hour procedure, left lateral tilt and strict hemodynamic control were kept. Periodic fetal monitoring and tocolytic infusion with atosiban were maintained throughout.

Drainage through the Ommaya chamber provided symptom relieve, and a c-section was planned at 37th week of gestation.

Cesarian was performed under total intravenous anesthesia (TIVA) using propofol target-controlled infusion, RSI and videolaryngoscopy to secure the airway. Gastric aspiration and triple antiemetic prophylaxis were given. Multimodal analgesia included a bilateral ultrasound-guided TAP block. C-section was uneventful, and a healthy male newborn was delivered.

Two months later, the mother was submitted to suboccipital craniotomy with excision of the posterior fossa lesion, a pilocytic astrocytoma, and removal of the Ommaya reservoir, under TIVA, with no complications.

Discussion: An experienced team involving Neurosurgery, Obstetrics, Neonatology and Anesthesiology was crucial to ensure mother, fetus and neonate health. Optimal timing, coordination and accurate anesthetic management of the surgical procedures minimized the risk of complications and allowed a positive outcome.

Reference:

1. Molina-Botello D, et al. Pregnancy and brain tumors: a systematic review. J Clin Neurosci. 2021;86:211-216.

Learning points: The complexity and rarity of this case highlights the need for standardized guidelines and interdisciplinary teamwork to maximize safety for brain tumour management during pregnancy.

21AP08-8

Noise during anesthetic induction in obstetric operating rooms: a prospective observational

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Background and Goal of Study: Excessive noise in the operating room (OR) during anesthetic induction has shown to have negative consequences for healthcare workers and patients. Data regarding noise levels during anesthetic induction in obstetric ORs is currently lacking.

This study was conducted to measure and report noise during anesthetic induction for cesarean deliveries, with the hypothesis that noise levels during anesthetic induction in our obstetric ORs would be higher than existing Occupational Safety and Health Administration (OSHA) recommendations.

Materials and Methods: 100 ASA II/III parturients scheduled for cesarean delivery under either neuraxial or general anesthesia were consecutively recruited in this observational study. Baseline noise, time-weighted (TW) maximum and average noise, and peak noise levels were measured during the time of anaesthetic induction using a decibel meter (Decibel X Software, SkyPaw Co Ltd, Hanoi, Vietnam) running on a dedicated android mobile device placed discretely at the head end of the operating table.

At the end of surgery, patients reported their satisfaction with OR noise on a simple 5 point Likert scale. Data was analyzed using measures of central tendency and dispersion.

Results and Discussion: The overall mean TW average and maximum noise were 32.4±7.51 dBA and 56.02±6.74 dBA, respectively. The mean TW average and maximum noise levels did not differ significantly between elective (n=47) and emergency (n=53) caesarean deliveries [32.64+4.32 vs 32.18+9.46, MD(95%CI) -0.46(-3.33 to 2.52), p=0.76 and 55.39+4.72 vs 56.58+8.13, MD(95%CI) 1.19(-1.49 to 3.87), p=0.38]. The median[IQR] number of personnel in the OR during anaesthetic induction was 9[8-11], which had a weak correlation with the TW average noise [r(95% CI)=0.25(0.05 to 0.42), p=0.01].

In our study, 92(92%) patients reported being satisfied with the noise levels during anesthetic induction. The mean TW average noise level reported in our study was within the recommended OSHA threshold of ≤45 dBA for hospitals, which reflected on the overall greater patient satisfaction levels regarding OR noise.

Conclusion: Mean TW average noise level during anesthetic induction in our obstetric ORs was less than OSHA thresholds, and did not differ significantly between elective and emergency cesareans.

Maintaining noise levels below OSHA threshold recommendations could result in higher patient satisfaction scores, which requires further exploration.

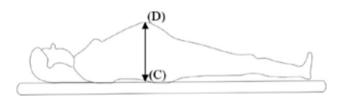
The relationship of back length and sagittal abdominal diameter with the level of sensorial block during spinal anesthesia for cesarean section: a prospective observational study

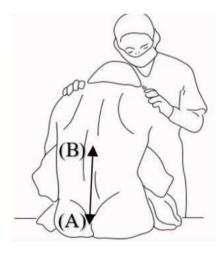
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Purpose: In this study, we aimed to investigate the relationship of sensory block level with back length and sagittal abdominal diameter in spinal anesthesia for cesarean section using anthropometric measurements.

Materials and Methods: This study was conducted in 45 patients of 18-40 ages included in the ASA II classification. The patients' abdominal circumference (AC) and sagittal abdominal diameter (SAD) were measured in the supine position.

Height, weight, body mass index (BMI) and body roundness index (BRI) were noted. Trunk length (TL) and back length (BL) were measured in the sitting position. 0.5% hyperbaric bupivacaine 2 ml was administered with a 25 G Quincke needle at the $L_{4.5}$ level. The level of sensory block, heart rate, blood pressure, ephedrine doses, frequency of hypotension were noted.





Results: There was no correlation between height, weight, BMI, BRI, TL, AC, BL, SAD with maximum block level or hypotension (p>0.05). There was no correlation between BL, SAD and BL/ SAD2 with maximum sensory block level time, T, time and hypotension (p>0.05). There was a negative correlation between T₄ time and BRI (r:-0.338, p<0.05), AC (r:-0.350, p<0.05), TL/AC2 (r:0.349, p<0.05).

There was a positive correlation between T₄ time and TL (r:0.442, p<0.01). There was a negative correlation between maximum sensory block time and BRI (r:-0.300, p<0.05) and a positive correlation with TL (r:0.550, p<0.01).

Conclusion: In our study, anthropometric measurements were shown to be effective parameters for the rise time of sensory block level in pregnancy.

Our study showed that not BL, which is the regional spine length, but TL, which is the length of the entire spine, is more effective; therefore, it is not correct to evaluate the compression only mechanically. AC width, TL shortness, and high BRI are warning parameters for rapidly rising spinal block in pregnant women.

21AP08-11

Infection with parvovirus B19 and maternal mirror syndrome: A case report

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Background: Acute parvovirus B19 infection in pregnant women remains asymptomatic in up to 50%, and the infections increases worldwide. Fetal infection with parvovirus B19 and subsequent fetal hydrops (FH) is among the life-threatening manifestations of the infection. FH describes the presence of excessive fluid accumulation in at least two fetal body cavities. In 5-30% of cases of FH, the child's symptoms are reflected on the mother as mirror

In these cases, women present with non-specific signs and symptoms such as peripheral edema, weight gain, dyspnea, hypertension, headache, and visual disturbances.

Case Report: We describe the case of a 37-year-old patient (ASA2, G1/P0) at 26 weeks pregnant at admission (fetal weight: 810g), presenting with fetal hydrops due to parvovirus B19 infection (verified with PCR) and sudden onset of acute myoperocarditis during hospital stay.

Fetal ultrasound showed FH with pericardial effusion, ascites, and skin edema, as well as intrauterine growth restriction with pathological venous hemodynamics, placentomegaly and oligohydramnios.

During the two fetal transfusions hemoglobin of the fetus significantly improved from 27 g/L at the beginning to 138 g/L after the second procedure and one fetal ascites puncture were performed. One day after the procedures, the patient first complained of tremor, dizziness, headache, shortness of breath, and left-sided chest pain.

These symptoms became more severe during the course of the day. The patient was being unable to tolerate the supine position due to dyspnea. Correspondingly, the O2 saturation in the supine position decreased from 98% to 92% with oxygen 2 L/min. An ECG showed diffuse concave ST-elevations. Troponin was elevated NT-pro BNP at 6171 pg/ml. An CT-scan ruled out lung embolism. The patient was monitored, and supportive therapy was initiated, which led to a rapid improvement in symptoms.

Discussion: The potentially overlapping symptoms of mirror syndrome and acute myopericarditis of the mother in combination with the FH emphasizes the importance of close monitoring of the baby but also the woman herself, and differential diagnoses must be ruled out. Multiparity, elevated BMI, hemodilution, hypoalbuminemia, anemia, and hyperuricemia are risk factors for the development of FH, and it can also develop after the treatment of the fetus. Delivery is frequently required for fetal and/or maternal indications, and symptoms usually improve rapidly after delivery.

A network meta-analysis comparing the efficacy of epidural blood patch and neostigmine with atropine for the treatment of post-dural puncture headache

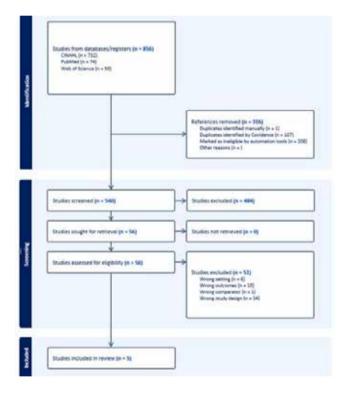
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Background and Goal of Study: Post-dural puncture headache (PDPH) is a common complication of neuraxial anesthesia in obstetric patients. The epidural blood patch (EBP) is the most effective treatment, but its invasive nature has led to the exploration of alternatives such as neostigmine combined with atropine.

This study compares the effectiveness of neostigmine/atropine. EBP, and placebo in managing PDPH using a network meta-analysis.

Materials and Methods: This network meta-analysis included 5 RCTs with a total of 331 patients.



Participants were divided into 3 groups: neostigmine/ atropine(n=71), placebo (n=90), and various doses of EBP (n=170). Headache severity was assessed at baseline and 24 hours post-treatment. The primary outcome was the mean difference in headache severity between groups, with 95% confidence intervals (CI) calculated for each comparison.

Results and Discussion: At baseline, the neostigmine/atropine group exhibited slightly lower pain severity compared to the EBP group. No significant differences were observed between the EBP and placebo groups at this time point. At 24 hours post-treatment, the EBP group demonstrated significantly greater efficacy in reducing headache severity compared to both the neostigmine/atropine group and the placebo group. While neostigmine/atropine provided notable pain relief compared to placebo, it was less effective than EBP in achieving headache reduction at 24 hours.

Comparison	Mean Difference	95% CI	p-value
Epidural vs. Neostigmine (0hr)	1.0209	[0.3904, 1.6514]	0.0015*
Epidural vs. Placebo (0hr)	0.2676	[-0.1960, 0.7312]	0.258
Epidural vs. Neostigmine (24hr)	-4.1753	[-4.9614, -3.3892]	<0.0001*
Epidural vs. Placebo (24hr)	-6.5759	[-6.9794, -6.1724]	<0.0001*

Table 1. Efficacy of EBP vs Neostigmine/atropine and Placebo

Conclusion(s): Although neostigmine/atropine provides notable pain relief, it is less effective than EBP in reducing PDPH severity at 24 hours after treatment. Given its non-invasive nature, neostigmine/atropine may be a viable alternative for patients unable or unwilling to undergo EBP. Future research is necessary to optimize Neostigmine in clinical settings.

21AP08-13

The peripartum anesthesia management of placenta accrete treated via Resuscitative **Endovascular Balloon Occlusion of the Aorta** (REBOA)

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Background and Goal of Study: Placenta accreta spectrum (PAS) disorders are associated with abnormal placental attachment to the uterine wall and pose a significant risk of severe postpartum hemorrhage. The rising incidence of PAS has prompted the exploration of advanced management techniques. Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) has emerged as a promising approach for managing hemorrhage in PAS cases, yet, optimal anesthetic strategy in these high-risk situations remains unclear.

This study aims to evaluate the anesthetic management and surgical outcomes of PAS patients treated with REBOA across four international centers, with a particular focus on factors influencing anesthesia choice, conversion to general anesthesia, intraoperative pain management, and overall surgical outcomes.

Materials and Methods: A retrospective analysis was conducted of PAS patients who underwent cesarean delivery with REBOA inflation between 2018, and 2021, at four medical centers (Soroka, Beilinson, Sharei Zedek, and La Paz). Data were collected from medical records, including demographic details, anesthetic techniques, blood loss, transfusion data, surgical details, and maternal and neonatal outcomes.

Results and Discussion: The choice of anesthetic technique varied significantly across centers, with combined spinal-epidural (CSE) being the most common (47.7%). Conversion to general anesthesia (GA) was highest in spinal anesthesia cases (60%) and lowest in CSE cases (23.8%).

Intraoperative pain was a significant issue, with 33.3% of patients experiencing breakthrough pain. REBOA was successfully used in all cases, with no related complications, although blood loss varied significantly across centers (1000-3000 ml).

The transfusion rate also showed considerable variation (14.3% to 88.9%). Maternal ICU admission rates and neonatal outcomes, including APGAR scores, varied across centers.

Conclusion(s): REBOA appears to be a safe and effective intervention for managing PAS-related hemorrhage, with minimal complications in our cohort. However, significant variability in anesthesia protocols and surgical management across centers highlights the need for evidence-based guidelines. Combined spinal-epidural anesthesia may offer advantages over single-shot spinal anesthesia, with a lower rate of conversion to general anesthesia. Ongoing research is essential to standardize anesthetic approaches, optimize pain management, and refine REBOA use in PAS cases.

The Paediatric Patient

22AP01-1

Paraoesophageal hernia type II in preterm critical ill newborn: a case report

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Background: Gastro-oesophageal reflux (GER) is common in children in the first months of life. Among the causes of GER, paraesophageal hernias are rare; they are primarily congenital and require timely diagnosis and urgent surgical intervention [1].

Case report: A preterm newborn, was admitted to the NICU on the 2-nd day of life with respiratory disorders, the need for mechanical ventilation (MV) and massive gastric bleeding. Diagnosis of haemorrhagic disease of the newborn was confirmed. As he stabilized and improved, feeding a small amount of infant formula through the gastric tube resumed. After weaning from MV and commencing full-volume feeding in the third week of life, he exhibited symptoms of GER, including vomiting with haematemesis. Anti-reflux therapy was unsuccessful. OGD revealed signs of esophagitis and hiatus hernia. A contrast swallow test confirmed the diagnosis, which assumed a type II paraesophageal hernia. The patient underwent Nissen fundoplication and crurorrhaphy.



Discussion: We presented a clinical case of a rare disease for children - paraesophageal hernia type 2, which was the cause of GER and vomiting in a neonate after reaching the age-appropriate feeding volume. Unlike most cases in adults, the mechanism of this pathology in neonates is congenital and apparently a variation in the failure of the central tendon of the diaphragm development. Factors associated with intensive care could cause a delay in identifying the actual congenital anomaly of the upper Gl. Such factors could be a pause in feeding, MV, intestinal paresis, another severe disease that manifests bleeding from the Gl,etc. Although haematemesis is one of the so-called "red flags" to rule out disorders other than GER, the simultaneous presence of other conditions, such as DIC syndrome or stress ulcers, may reduce vigilance in searching for surgical pathology.

References:

1. Garvey EM, Ostlie DJ. Hiatal and paraesophageal hernia repair in pediatric patients. Semin Pediatr Surg. 2017 Apr;26(2):61-66. Learning points: Hiatal hernia is a rare condition for newborns. In the differential diagnosis consider the possibility of a congenital diseases of the upper GI.

22AP01-2

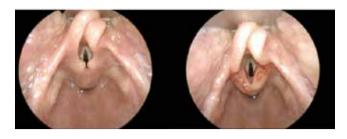
Pediatric airway management in cold-steel supraglottoplasty: a case report

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Background: Laryngomalacia is the leading cause of chronic inspiratory stridor in children, with 10% of cases requiring surgical intervention¹. Reduced airway diameter can make manual ventilation and orotracheal intubation challenging.

Case Report: A 2-year-old girl with congenital laryngomalacia was scheduled for cold-steel supraglottoplasty. Standard ASA monitoring was applied, along with anesthetic depth monitoring with BIS® and cerebral oximetry with INVOS®. We used intravenous anesthesia (TIVA) with propofol and remifentanil and high-flow nasal oxygen therapy (HFNO) while maintaining spontaneous ventilation. The procedure was uneventful, maintaining hemodynamic stability and spontaneous ventilation without desaturation.





Discussion: Laryngomalacia presents significant challenges due to airway management complexity. This case demonstrates a successful approach using TIVA, HFNO and maintenance of spontaneous ventilation. HFNO prolongs apnea tolerance, allowing deeper anesthesia during periods of heightened stimulation and reducing interruptions for rescue oxygenation².

TIVA allows unobstructed surgical access to the airway, anesthetic depth independent of the airway and avoids environmental contamination, though it increases risks of apnea and patient movement3

References:

- 1. Robbins A. Operative Techniques in Otolaryngology-Head and Neck Surgery. 2022;33(3):175-178;
- 2. Kim JY. Medicine. 2021;100(49):e28102-e28102; [3] Oshan V. Continuing Education in Anaesthesia Critical Care & Pain. 2013:13(2):47-51.

Learning points:

- · Laryngotracheal surgeries present challenges for anesthesiologists due to the shared airway, increasing the risk of perioperative airway compromise;
- · Due to the rarity of this condition, no standard anesthetic protocols exist, making thorough preoperative planning and multidisciplinary coordination essential.

22AP01-3

The phenomena of arrhythmia-induced cardiomyopathies (AICM): what comes first, the chicken or the egg?

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Background: AiCM is an important reversible cause of heart failure that is likely underestimated in clinical practice due to the uncertainty in diagnosis. Diagnosis can only be made after witnessing ventricular function recovery with successful rhythm or rate control, or the very clear onset of cardiomyopathy temporally associated with the onset of arrhythmia.

Case Report: A 7-year-old male patient came to our pediatric ED for palpitations, fatigue and chest pain. One week ago the patient had symptoms of flu, but at the moment of hospitalization no evidence of viral or bacterial infection was found. Electrocardiogram (ECG) revealed atrioventricular dissociation with atrial rate faster than the ventricular, and average heart rate of around 190 bpm. Transthoracic echocardiogram was performed and severe congestive heart failure was diagnosed with global hypokinesia and dilation of the left ventricle. The NT-Pro-BNP was 26725pg/ml. Consequently, a therapy with amiodarone and beta blocker was gradually designed to control the arrhythmic pattern. After the decrease of heart rate, we continued to treat the heart failure with beta blocker carvedilol, digoxin, ACE inhibitor and diuretics. At the first check-up after discharge there were still no signs of sinus rhythm on EKG, but the heart function was easily improved.

Discussion: Reversible forms of cardiomyopathies due to arrhythmic causes in pediatric patient represent a rare event. Even if the causative arrhythmia is apparent, the clarification of a causeeffect relationship sometimes provokes a diagnostic "headache" for the treating physician, since diagnosis may be confirmed only retrospectively. Raising awareness of the difficulties of diagnosis and all available treatment options is essential for a better management of dysrhythmia in children.

Reference:

1. Emmanuel N. Simantirakis, Emmanuel P. Koutalas, Panos E. Vardas, Arrhythmia-induced cardiomyopathies: the riddle of the chicken and the egg still unanswered?, EP Europace, Volume 14, Issue 4, April 2012, Pages 466-473, https://doi.org/10.1093/ europace/eur348

22AP01-4

The whistling boy: an anesthetic challenge

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Background: This case highlights the importance of flexible adaptation in airway management, including the use of jet ventilation and emphasizing its value in pediatric bronchoscopy.

Case Report: A 5-year-old male patient, 20 kg, ASA I, went to the pediatric department 1 day after swallowing a small whistle. A whistle sound was audible on physical examination when the patient deep breathed. His vital signs were stable, he had no respiratory distress and did not require supplemental oxygen. After a thoracic x-ray, the foreign body was found to be in middle trachea. The initial plan was a flexible bronchoscopy through a laryngeal mask airway (LMA) under intravenous general anesthesia.

After standard ASA monitoring, anesthesia was induced using 60 µg of fentanyl, 60 mg of propofol and 15 mg of rocuronium. Once a sufficiently deep level of anesthesia was achieved, a size 2.5 Igel® LMA was successfully inserted. Anesthesia was maintained using continuous infusion of 1% Propofol.

Flexible bronchoscopy was unsuccessful in removing the foreign body, and a rigid bronchoscopy was required. The airway management was modified to manual jet ventilation using the Manujet III® system. The maximum driving pressure was 1.4 bar, frequency of 30 breaths per minute, FIO₂ of 100%. Over the course of 10 minutes, a rigid bronchoscopy was performed, successfully removing the foreign body. The patient maintained stable vital signs, including a SpO2 of 100%.

After completing the bronchoscopy, the patient was transitioned from jet ventilation to facial mask ventilation, and neuromuscular blockade was reversed with 40 mg of sugammadex. Spontaneous ventilation resumed within 5 minutes. The perioperative course was uncomplicated, and the patient was discharged 1 day following the procedure.

Discussion: Rigid bronchoscopy requires a clear and stable operative field. Anesthesia using manual jet ventilation has proved a valuable technique in procedures where thoracic immobility is required.

Reference:

Miyawaki, J. https://doi.org/10.1016/s0952-8180(03)00023-0 Li, S.(2010), https://doi.org/10.1016/i.iiporl.2010.09.018 Learning points: Manual jet ventilation can maintain a stable and unobstructed operative field, enabling the successful removal of a foreign body in a child with a previously stable presentation.

22AP01-5

Exploring anesthetic strategies in rare disorders: a case of molybdenum cofactor deficiency

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Background: Molybdenum cofactor deficiency (MoCD) is a rare autosomal recessive disorder characterized by disrupted metabolic pathways and neurotoxic sulfite accumulation. MoCD leads to neurological impairment, including seizures. Prognosis is poor, with high mortality and limited treatment options.

Limited cases have been reported, and evidence on anesthetic management remains sparse, posing challenges in managing these patients1.

Case Report: We present a nonoperation room anesthesia (NORA) case of a 15-month-old female with MoCD Type A who underwent brain MRI under deep sedation. The patient weighed 9 kg and displayed severe neurological symptoms, spasticity and intractable seizures, despite a regimen of anticonvulsants (vigabatrin, levetiracetam, phenytoin, and diazepam).

No premedication was given, and sedation was achieved with sevoflurane administered via a facial mask under spontaneous ventilation.

Continuous monitoring included oxygen saturation, heart rate, and capnography. The procedure lasted 37 minutes and went without complications. Following sedation, the patient was closely observed for three hours, with recovery assessed using the Modified Aldrete Score, being discharged home after.

Discussion: This case underscores the importance of individualized plan in MoCD. Perioperative continuation of anticonvulsants and a proactive plan was in place for managing intraoperative seizures to mitigate risk, highlights the importance of preemptive measures in high-risk patients.

Sevoflurane was chosen for its ability to enhance GABA-mediated neuronal inhibition, reducing excitability and seizure risk, while supporting spontaneous ventilation. It offers an alternative to agents like propofol, which should be avoided due to its high lipid content2.

References:

1. Alkan M. Choice of anesthesia in molybdenum cofactor deficiency: A case report. J Res Med Sci. 2014 Nov 2. Prasun P. Multiple Acyl-CoA Dehydrogenase Deficiency. GeneReviews® [Internet] https://www.ncbi.nlm.nih.gov/books/ NBK558236/

Learning Points: While a simple plan such as deep sedation with sevoflurane may seem effective, it doesn't mean it's safe. Pediatric NORA presents unique challenges that require anesthesiologists to remain vigilant for complications.

Awareness of the patient's underlying condition and readiness to address unexpected events are paramount to ensure optimal outcomes. We postulate that sevoflurane can be a relatively safe drug to utilize in patients with MoCD deficiency.

22AP01-6

Anesthetic management for syndactyly correction in a toddler with Poland syndrome: a case report

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Background: Poland syndrome (PS) is a rare congenital condition affecting 1:30,000 to 1:80,000 live births, characterized by hypoplasia/agenesis of the pectoralis major muscle, often associated with upper limb and thoracic abnormalities. It poses specific anesthetic challenges, including risks of malignant hyperthermia (MH) and ventilation problems.1

We report the anesthetic approach for outpatient syndactyly correction in a toddler with PS, emphasizing the safe and valuable use of ketamine-dexmedetomidine (Ketodex) premedication.

Case Report: A 19-month-old boy with PS presented for outpatient correction of syndactyly of the right hand. He had agenesis of the pectoralis major, hypoplastic hand and syndactyly of the second and third fingers at the right side of the body. Medical history was significant for recurrent bronchiolitis.

Preoperative sedation with intramuscular ketamine (1mg/kg) and dexmedetomidine (1mcg/kg) facilitated operating room admission and enabled venous access cannulation and regional anesthesia. An axillary brachial plexus block with levobupivacaine 0.25%/5mL was performed under ultrasound guidance. Sedation was maintained with propofol target-controlled infusion, monitored by Bispectral Index™.

The 75-minute procedure was uneventful. Spontaneous ventilation was preserved, and SpO2 >98% was maintained with supplemental oxygen at 2L/min through nasal cannula.

Postoperative analgesia was supplemented with paracetamol 20mg/kg, ketorolac 0.5mg/kg and dexamethasone 0.2mg/kg. Recovery was smooth and the patient was able to feed within 40 minutes, being discharged home 5.5 hours post-surgery.

Discussion: PS requires individualized anesthetic strategies to avoid MH triggers, such as succinylcholine and halogenated agents, as well as close ventilatory vigilance if a spontaneous ventilation strategy is chosen. This is the first report demonstrating the safety and efficacy of Ketodex premedication in PS1. Regional techniques and intravenous agents are ideal to safely manage these patients and optimize recovery.

Reference:

1. Gui L, Shen S, Mei W. BMC Anesthesiol. 2018;18:57. Learning points:

- · Avoidance of MH triggers is a priority in PS patients.
- · Regional anesthesia combined with intravenous anesthesia provide effective perioperative management, minimizing risks and enabling rapid recovery in outpatient surgeries.
- · Ketodex premedication provides safe sedation, reducing healthcare associated distress and facilitating regional anesthesia.

22AP01-8

Effect of head position on nasotracheal intubation with video-laryngoscope in pediatric patients: a randomized controlled trial

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Background and Goal of Study: Nasotracheal intubation requires precise control of the tube tip for successful placement. In pediatric patients, anatomical differences pose additional challenges. The flexibility of wire-reinforced tubes further complicates tube manipulation in children. While head position adjustments have been shown to aid nasotracheal intubation in adults, their effects in pediatric patients remain unexamined.

This study aimed to evaluate the impact of different head positions (sniffing, neutral, and flexion) on the ease of nasotracheal intubation in children using a video laryngoscope (AceScope®).

Materials and Methods: This randomized trial included pediatric patients aged 1-10 years assigned to sniffing, neutral, or flexion positions. Intubation was performed using a video laryngoscope and wire-reinforced tubes.

The primary endpoint was the total intubation time, defined as the duration from the moment the tube was inserted into the nostril to the detection of end-tidal CO₂ on the monitor.

Secondary endpoints included time for each intubation stage (nostril to oropharynx, oropharynx to glottic opening, glottic opening to trachea and intubation difficulty assessed with IDS and subjective scores.

Results and Discussion: No significant differences were observed in total intubation time or stage-specific times among the three groups (median [IQR]: 67.5 [60.3-83.3] s, 66.5 [60.0-76.0] s, 74.5 [63.5–90.8] s; P = 0.149). Stage-specific and overall intubation difficulty showed no significant differences. The use of the cuff inflation method did not differ significantly among the three

However, in the flexion group, two cases required Magill forceps because the tube tip could not be positioned at the glottic entrance even after the maximum cuff inflation.

Conclusion(s): This study found no statistically significant differences among the three head positions in terms of total intubation time, stage-specific intubation times, or intubation difficulty in pediatric patients using a video laryngoscope.

However, the flexion position was less practical for routine anesthesia practice and offered no notable advantages.

These findings suggest that the sniffing and neutral positions are recommended for effective and practical nasotracheal intubation in pediatric patients.

22AP01-9 **Pediatric Anaesthesia Management in Advanced Pelvic Ewing Sarcoma Resection**

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Background: Administering regional anaesthesia in pediatric patients presents unique challenges, and has potential adverse effects of opioid use in the perioperative period, especially in cancer patients. Increased opioid administration has been associated with immunomodulatory effects, including prolonged immunosuppression post-surgery. This suppression increases the risk of postoperative infections, posing challenges to recovery.

Our case report details the perioperative analgesia of a pediatric patient undergoing radical pelvic resection.

Case Report: We present the case of a 12-year-old boy with advanced pelvic Ewing sarcoma. After a favourable response to neoadjuvant chemotherapy, he underwent a radical pelvic resection. To manage pain effectively, we employed combined epidural and spinal anaesthesia alongside general anaesthesia.

The patient received standard preoperative monitoring. An epidural catheter was placed at L2-L3, followed by a subarachnoid block at L4-L5, administering 2.4 mL of 0.5% bupivacaine and 20 ug fentanyl. Both procedures adhered to guidelines.

General anaesthesia was induced with propofol, remifentanil (TIVA) and rocuronium. The patient remained hemodynamically stable during the 11-hour surgery, requiring only a single bolus of 10 mL of 0.25% levobupivacaine via the epidural catheter.

Postoperatively, he was extubated and transferred to the ICU. A continuous infusion of 1 mL/h of 0.2% levobupivacaine was initiated, with 7.5 mL boluses every 180 minutes.

The patient reported effective pain control and satisfaction with the regimen. The epidural catheter was removed on fifth postoperative day without complications.

Discussion: The latest studies show a connection between opioid analgesia and immunomodulation. We were able to provide successful pain management while minimizing the potential adverse effects of opioids. By first administering an epidural catheter and then a spinal block we were able, in the absence of a CSE needle, to position the catheter correctly.

Our analgesia technique provided excellent pain relief while maintaining stable hemodynamics, minimizing the need for additional analgesics, especially opioids, reducing the risk of immunomodulatory side effects.

Learning points: This case highlights the efficacy of combined epidural and spinal anaesthesia as a perioperative adjuvant analgesia strategy in pediatric cancer patients undergoing complex surgeries.

22AP01-10

Does a change in optic nerve sheath diameter have an association with postoperative emergence delirium in paediatric patients undergoing laparoscopic surgeries?

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Background and Goal of Study: Emergence delirium(ED) is one of the most common postoperative problem in paediatric population. The optic nerve sheath is linked to meninges, enabling cerebrospinal fluid to flow freely between the subarachnoid spaces of both intracranial and intraorbital regions. So patients with an elevated intracranial pressure(ICP) demonstrate an increase in optic nerve sheath diameter(ONSD). Due to the use of pneumoperitoneum during laparoscopic surgery, there is an increased risk of elevated ICP and ONSD.

The hypothesis is that an intraoperative change of ONSD will have an association with postoperative ED in paediatric patients undergoing laparoscopic surgeries.

Materials and Methods: A Prospective observational cohort study. Children between 2-8 years of age were premedicated with 0.1mg/kg midazolam before wheeling to the OR.

After induction of anaesthesia, three measurements of ONSD was acquired in both horizontal and vertical planes in each eye at 3 timepoints- T1, immediately after induction; T2, 15 minutes after intraperitoneal CO2 insufflation; T3, 10 minutes after releasing pneumoperitoneum. The mean value of ONSD from both eyes was calculated at each time point. In PACU, ED was assessed using PAED scale at each 5 minute interval till 30 minutes from the time of awakening. A score >10 will qualify to be presence of ED. Pain assessment was done using Face, Legs, Activity, Cry and Consolability(FLACC) scale.

Results and Discussion: Total 60 patients were recruited. No significant association was observed in percentage change in ONSD with emergence delirium at T2 (10.29 [4.668-18.068]% in patients with emergence delirium vs. 12.8 [6.383-16.806]% in patients without emergence delirium, p value = 0.594) and T3 (15.51 [8.181-23.387]% vs. 22.97 [10.65-30.91]%, p value=0.196). Median (25-75th percentile) FLACC score on arrival to PACU was significantly higher in patients with ED (6[5.25-6.75]) compared to patients without ED(0[0-0]) (p value <0.0001).

Non significant very weak negative correlation was seen between percentage change in EtCO2 at T2 with percentage change in ONSD at T2 with correlation coefficient of -0.053 and at T3 with correlation coefficient of -0.074.

Conclusion(s): There is no significant association between intraoperative change in ONSD and postoperative delirium in paediatric patients undergoing laparoscopic surgeries.

The study has to be conducted in large sample size to prove statistical significance.

22AP01-11

Evaluation of factors affecting the need for postoperative ICU care in pediatric patients undergoing Nissen Fundoplication surgery: a retrospective study from anesthetic perspective

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Background and Goal of Study: Nissen fundoplication (NF) surgery is a high-risk surgery in terms of postoperative respiratory failure and the need for intensive care due to the frequently co-existing neurological and lung-related diseases in the patient population, the low functional capacity of the patients, and the fact that it constitutes a major intervention to upper abdomen.

Our aim in this study is to investigate the factors that may affect the need for postoperative ICU care of pediatric patients undergoing NF surgery.

Materials and Methods: Between January 2018 and January 2023, 98 cases under the age of 18 who had NF surgery in our hospital were included. Data were obtained by retrospectively examining the hospital database system and anesthesiology followup forms in patient files. The patients' age, gender, body weight, preoperative BUN, albumin values, as well as surgery type, accompanying neurological disease, cardiac disease, recurrent lung infection and preoperative antibiotic use were obtained after approval from our university IRB (24.10.23, SBA-23/236).

Results and Discussion: While the total intensive care unit admission rate was 33.7%, the endotracheally intubated transfer to ICU with a mechanical ventilation requirement was 11.2% and the rate of postoperative respiratory failure was 5.1%.

The incidence of neurological disease, recurrent lung infection. and the co-existence of both neurological disorder and recurrent lung infection were found to be higher in the postoperative intensive care unit group (p=0,095; p=0,115 and p=0,102), despite revealing no statistical significance.

Similarly, although the frequency of antibiotic use due to preoperative pneumonia was higher in the postoperative intensive care unit group, the difference was not statistically significant (p=0,272).

Low albumin level (<3.5 g/dl) was a risk factor independent of other factors in predicting the need for intensive care after surgery (p=0.014). As the albumin level increased, the need for ICU care after surgery decreased (OR=0,186; %95 CI: 0,061-0,564 p=0.003).

Conclusion(s): It has been shown that preoperative albumin level may be a significant risk factor in determining the need for postoperative intensive care in pediatric patients undergoing NF surgery, and that co-existing recurrent lung infection or neurological disease may also be important factors in determining the need for postoperative intensive care.

22AP02-1

COPPER study: An RCT comparing cryoanalgesia with epidural in children undergoing pectus excavatum repair. A personalized approach through digital

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Background and Goal of Study: Pectus Excavatum is the most common pediatric chest wall deformity. Post-operative pain can be managed with a multimodal approach, including thoracic epidural analgesia. Intercostal cryoanalgesia is a promising alternative but further validation is needed.

We designed an RCT comparing cryoanalgesia with epidural integrating a clinical follow up and a more personalized approach: the digital twin.

Materials and Methods: This RCT study was developed in two stages. The first stage was a clinical follow-up with PedsQL score at 14 days after surgery integrated, in the second stage, with realtime physiological measures (such as heart rate, sleep quality, activity levels before and after surgery) provided by a wearable digital health technology (DHT).

The aim was to develop a patient's digital twin to personalize post-operative recovery tracking. Both stages were conducted at IRCCS G. Gaslini Hospital, Genoa, enrolling participants aged 12 and older to receive either cryoanalgesia or epidural analgesia.

Results and Discussion: Results of this abstract are focused on the second stage of the COPPER study. 20 patients were included with a median age of 14.50 years. PedsQL score was comparable between the two arms of treatment (81 in study group vs 80 in epidural group).

Patients in the study group experienced delayed onset of analgesic effect, often requiring supplementary pain management within the first 24-48 hours post-surgery, but they were discharged earlier than patients in the epidural group (3.5 days vs 4 days, respectively, p-value=0.031).

Digital twins analysis showed that patients in the cryoanalgesia group had higher daily step counts, suggesting a potentially faster return to activity (Figure 1).

Challenges, such as variable patient's compliance to wearable devices, might have influenced data accuracy and analysis.

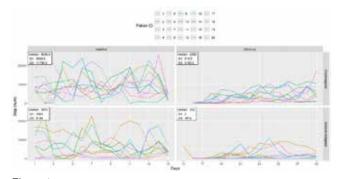


Figure 1.

Conclusions: Cryoanalgesia and epidural showed comparable efficacy in terms of quality of life 14 days after surgery. The use of wearable DHTs provided valuable insights into individualized recovery patterns, including tailored pain management strategies to facilitate early return to preoperative activities.

22AP02-2

They keep bleeding: von Willebrand disease and tonsillectomy - a case report

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Background: Von Willebrand disease (VWD) is an inherited bleeding disorder characterized by reduced levels or dysfunction of von Willebrand factor (VWF), which due to impaired blood clotting, poses a significant risk of severe bleeding during surgery. This case report details the treatment of a 9-year-old with VWD Type 1 undergoing a tonsillectomy, reviewing the current guidelines.

Case Report: A 9-year-old girl with Type 1 VWD was scheduled to undergo a tonsillectomy. Diagnosed at birth due to intraparenchymal bleeding, she was under regular hematology care. Preoperative testing confirmed low VWF and factor VIII levels. She received 40 IU/kg of plasma-derived VWF before surgery and an additional 20 IU/kg 8 hours postoperatively. The initial recovery was uneventful. However, on the 15th postoperative day, she experienced significant bleeding from the right tonsil, requiring emergency surgery. Upon induction of anesthesia, she was given 20 IU/kg of plasma-derived VWF and 20 mg/kg of tranexamic acid. A follow-up dose of 20 IU/kg VWF was administered three days later to maintain VWF activity above 50%. The patient recovered well and was discharged on the third day after her second hospitalization.

Discussion: Tonsillectomy, though considered routine, presents a heightened bleeding risk in VWD patients. While DDAVP may suffice for minor to moderate bleeding, it may be inadequate for the significant bleeding risks associated with tonsillectomy and carries potential side effects. Thus, the combination of tranexamic acid with plasma-derived or recombinant VWF is preferred for major surgeries. Cryoprecipitate should be reserved for situations where other VWF products are unavailable.

Ensuring adequate preoperative VWF and factor VIII therapeutic levels together with an interdisciplinary approach is crucial for optimizing outcomes.

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- 2. Santoro C, Hsu F, DiMichele DM. Haemostasis prophylaxis using single dose desmopressin acetate and extended use epsilon aminocaproic acid for adenotonsillectomy in patients with type 1 von Willebrand disease. Haemophilia. 2012 Mar;18(2):200-4. Learning points: Preoperative VWF and factor VIII monitoring is crucial. VWF and tranexamic acid are effective for major bleeding. Interdisciplinary care is essential

22AP02-3

Impact of dedicated paediatric trauma lists on out of hours emergency surgical caseload in a tertiary paediatric hospital, 10 years on

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Background and Goal of Study: Following the introduction of thrice weekly (Mon, Thurs, Fri) dedicated trauma lists in May 2011, we witnessed a drop in 'out of hours' (OOH) orthopaedic trauma cases as a proportion of all OOH operating from 35% in 2010 to 29% in 2011

In this study, we aimed to follow up on whether this improvement has been sustained in post-pandemic years.

Materials and Methods: We interrogated the theatre management software for all emergency operations from October 2018 to June 2024, dividing them into orthopaedic and non-orthopaedic surgery. We classified cases as OOH if they occurred over weekends, public holidays and weekdays on or after 17:30 and before 08:30 hours. To counter the effects of seasonal variations, we focused on 2019-2023, where data was available for complete vears

Results and Discussion: The number of cases for individual years are shown in Table 1. 3898 emergency operations were conducted in the period, including 1301 orthopaedic and 2597 non-orthopaedic cases. 1101 cases were performed out of hours, made up of 218 orthopaedic cases and 883 non orthopaedic cases.

OOH cases only	2019	2020	2021	2022	2023	Total
All OOH cases	208	255	191	223	224	1101
Orthopaedic OOH cases	40	55	39	43	41	218
Percentage Ortho / All cases	19.2	21.6	20.4	19.3	18.3	19.8

Table 1.

The percentage of all out of hours operating which was emergency orthopaedic averaged at 19.8% (range 18.3 - 21.6%). This shows a further improvement since the previous study (in 2012). Increased provision of emergency surgery in hours has widereaching benefits1.

Dedicated trauma lists at the Royal Alexandra Children's Hospital mean more children are discharged from the emergency department to return for day case procedures, reducing overnight admissions, risk of hospital acquired infection, cost of admission and improving the patient experience.

Conclusion(s): This study has demonstrated sustained improvement in OOH orthopaedic case numbers since the introduction of dedicated in-hours trauma lists, with positive implications for elective list staffing, staff wellbeing and patient safety.

Reference:

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22AP02-6

Tunneled central venous catheters - beyond scholastic education

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Background and Goal of Study: Intravascular catheters are used for infusion of hyperalimentation fluids, blood products, antimicrobial and chemotherapeutics; hemodialysis and plasmapheresis. Complications include arterial puncture, pneumothorax, air embolism, catheter malposition or kinking, infection and thrombosis. [1] Tunneled catheters are generally performed by interventional radiology and pediatric surgery, but in recent years they have also been used by anesthesiologists.

The aim of this study was to investigate the complication rates of tunneled catheters inserted in our clinic in a 4-month period.

Materials and Methods: In this retrospective observational study, 15 pediatric patients having tunneled catheter insertion were included. Demographic data, data about the catheter insertion procedure and complications were obtained. Jamovi software was used for analysis.

Results and Discussion: Seven of the fifteen patients were male (47.7%). Mean age was 12.8 years (range 5-17). The internal jugular vein was used in all patients, eleven right and three left. The procedure was successful in all but one. Complications such as thrombosis, pneumothorax, subcutaneous emphysema were not observed. Catheter-related infections were observed in three patients and catheter dysfunction in four.

Mean procedure time was 52 minutes (range 28 to 85). Catheter thicknesses were selected according to current guidelines by evaluating the age and body weight of the patients. Catheter lengths were adjusted by taking measurements from thoracic Xrays. At the end of the procedure, confirmation was performed with C-armed scopy.

Conclusion(s): Tunneled central venous catheter placement is associated with some difficulties and complications. Taking the necessary precautions, performing the procedure in accordance with the current literature and guidelines, performing the catheterization procedure with a planned strategy and appropriate imaging methods, and applying the correct catheter care may reduce the risk of complications.

We should follow surgical discipline, learn the technique well and teach it well for this procedure that we anesthesiologists have just started to learn.

Reference:

1. P. Bream, "Tunneled Central Venous Catheters," in Image-Guided Interventions, 3rd ed.2021, pp. 677-682.e1.

22AP02-8

Anesthesia management in Smith-Lemli-Opitz syndrome: a case report

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Background: Smith-Lemli-Opitz Syndrome (SLOS) is a rare autosomal recessive disorder caused by a deficiency in the enzyme 7-dehydrocholesterol reductase, resulting in multiple congenital anomalies and cognitive impairment. It affects multiple organ systems including the airway, gastrointestinal, genitourinary and central nervous systems.¹

Anesthesia management in SLOS is challenging, especially due to the increased risk of muscle rigidity and malignant hyperthermia.

Case Report: A 5-year-old 15 kg male child, was scheduled for an adenotonsillectomy. He had been diagnosed with SLOS type 1 at birth and had undergone a trigonocephaly surgery at 15 months. The patient also had autism spectrum disorder and dysphagia with solid foods. Systemic examinations and laboratory tests were normal. Preoperative vital signs were normal.

Total intravenous anesthesia (TIVA) was planned using 2% propofol and remifentanil, avoiding inhalational agents due to the risks associated with SLOS. The patient was scheduled as the first case.Premedication with 0.5 mg/kg midazolam was given.

In the operating room standard monitoring was applied,followed by induction with 0.1 mg/kg atropine,2 mg/kg propofol and 0.3 mg/kg rocuronium. To prevent nausea-vomiting and for antiedema traetment,3 mg of dexamethasone was administered.

Endotracheal intubation was successfully achieved with a 4.0 cuffed tube on the first attempt. Maintenance anesthesia consisted of 0.5 mcg/kg/min remifentanil and 6 mg/kg/hr 2% propofol.which was later increased to 8 mg/kg/hr.

Postoperative analgesia included 100 mg of paracetamol and 0.5 mg of intravenous morphine. Extubation was uneventful.

Discussion: Careful preoperative evaluation is essential for patients with SLOS, given the potential for difficult airway management.²

In this case, direct laryngoscopy facilitated successful intubation, although videolaryngoscopy and supraglottic airway devices may also be effective. For patients at high risk for malignant hyperthermia, TIVA is preferred to avoid inhalational anesthetics.

This case underscores the need for a tailored anesthetic approach in SLOS, highlighting the importance of a multidisciplinary team to ensure safe outcomes for this complex patient population.

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- 2. Choi PT, Nowaczyk MJ.Anesthetic considerations in Smith-Lemli-Opitz syndrome.Can J Anaesth. 2000;47:556–61

22AP02-9

Dexmedetomidine sedation in children undergoing magnetic resonance imaging: doses, effectiveness and side effects

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Background and the Aim of the Study: Sedation and general anesthesia have facilitated magnetic resonance imaging examinations in children. Soon after the procedure is performed, the patient can be safely discharged from the hospital on the same day. Dexmedetomidine is a new drug, that causes loss of consciousness similar to normal sleep, which makes it a suitable alternative to general anesthesia for pediatric MRI. It reduces the level of exposure to conventional anesthetic agents and invasive ventilation. Previous studies have shown that there is an extensive range of doses of this drug that can achieve adequate sedation in children. However, high doses can lead to hemodynamic instability, accompanied by bradycardia and hypotension.

This study aimed to examine dexmedetomidine effectiveness and cardiopulmonary safety as a sedative drug for children undergoing MRI.

Methods/materials: This was a prospective study where data was analyzed from 177 consecutive patients who were sedated with dexmedetomidine for MRI from October 2023 to September 2024

Results and discussion: The 10-minute loading dose, according to our dexmedetomidine protocol varied from 1 to 4 mcg/kg with an average dose of 1,83 mcg/kg, and the infusion rate varied from 0,7 to 5 mcg/kg/h with an average dose of 1,75 mcg/kg/h.

Our results showed a 24,3% lower heart rate than the age-adjusted normal range after the loading dose and a 21,54 % lower heart rate during the infusion dose. Mean arterial blood pressure was within 15,6 % of the age-adjusted normal range after the loading dose and 17,6% lower than the age-adjusted normal range during the infusion dose. Oxygen saturations measured by pulse oximetry were 98% or higher. Additional drugs were needed in 5% of natients

Conclusion: Dexmedetomidine is useful as the sole sedative for pediatric MRI. Using dexmedetomidine in high doses is associated with a decrease in heart rate and blood pressure, but it did not cause severe side effects.

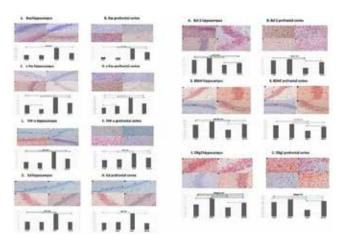
22AP02-10

Effects of prophylactic vitamin D on behavioral hyperactivity and neurotoxicity in mice exposed to sevoflurane on postnatal day 10

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Background and Goal of Study: Sevoflurane is a GABA-A receptor agonist. GABA can induce excitatory postsynaptic responses in young neurons Sevoflurane-induced neuronal activation and behavioural hyperactivity may contribute to the agitation observed in children. Exposure to anaesthetics may lead to neuroinflammation and neuroapoptosis.

Materials and Methods: Vitamin D (vit D) is a regulator in various physiological pathways such as brain development, immunomodulation. This study investigated the effects of vit D on behavioural hyperactivity and neurotoxicity in young mice exposed to sevoflurane.



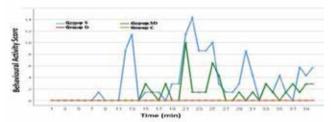


Fig 1a. Sevoflurane induced behavioral hyperactivity

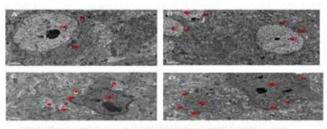


Fig 1b. EM views of hippocampus. A. Group C B. Group D C. Group S D. Group SD

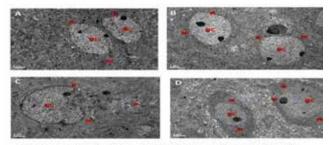


Fig 1c. EM views of prefrontal cortex. A. Group C B. Group D C. Group S D. Group SD

Results and Discussion: Twenty-eight Swiss albino mice were randomly divided into four groups: Vitamin D (GD), control (GC), sevoflurane (GS) and vitamin D+sevoflurane (GSD) groups. Mice in GD and GSD received daily intraperitoneal injections of 5 µg/ kg calcitriol from PN to PN10, while mice in GC and GS received saline injections. On PN10, mice in GS and GSD were placed in an anaesthesia chamber (35x15x15 cm) for 5 min to habituate to the environment. Mice in GS and GSD were exposed to 2% sevoflurane in 100% O₂ at a flow rate of 2 L/min for 10 min. Mice in GC and GD received 100% O_a. After exposure, all mice were allowed to recover in a chamber for 40 min.

Behavioural activity of each mouse was recorded and scored using the Behavioural Activity Score. Hippocampus and prefrontal cortex sections from six mice per group were examined by immunohistochemical methods (IHM) and electron microscopy (EM). IHM was used to assess the expression of IL6, BDNF, TNF-α, c-Fos. Bcl-2. Bax and Olig2.

Conclusion(s): Vit D treatment reduced behavioral hyperactivity in GSD compared to GS. In GSD, Bax, IL6, TNF-α and c-Fos expressions were decreased, whereas BcI-2, Olig2 and BDNF expressions were increased compared to group S (p<0.0001). EM images supported these data.

22AP02-11

Anesthetic management challenges in pediatric patients with Congenital Long QT Syndrome

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Background: Congenital long QT syndrome (LQTS) is a cardiac condition marked by a prolonged heart rate-corrected QT interval (QTc) in the absence of structural heart disease. It commonly manifests in childhood and presents significant perioperative risks due to sympathetic stimulation or exposure to QT-prolonging drugs, increasing the chance of life-threatening arrhythmias.

Case Report: A 5-year-old female undergoing elective Morgagni hernia repair under general anesthesia was found to have a QTc of 467 ms, suggestive of LQTS. Propranolol therapy was initiated, and oral midazolam was used as premedication. Poor cooperation required sevoflurane induction, which resulted in QTc prolongation and transient ST segment depression that resolved upon discontinuation.

Intravenous induction was subsequently performed with lidocaine, fentanyl, propofol, and rocuronium. Maintenance was achieved with total intravenous anesthesia (TIVA) using propofol. The patient recovered uneventfully.

Discussion: This case highlights the anesthetic challenges in pediatric LQTS patients, emphasizing the importance of avoiding sympathetic stimulation during induction. Premedication with midazolam can attenuate the sympathetic response without affecting QTc. While inhalational agents like sevoflurane may be necessary for induction in uncooperative patients, they must be used cautiously due to their QT-prolonging effects. TIVA emerges as a safer alternative, minimizing arrhythmia risk.

Perioperative management requires strict avoidance of hemodynamic and respiratory instability, including hypertension, bradycardia, tachycardia, hypoxemia, and hypocapnia or hypercapnia, to optimize safety.

References:

- 1. E. Balestra et al., "Congenital Long QT Syndrome in Children and Adolescents: A General Overview," Children, vol. 11, no. 5, p. 582, May 11, 2024.
- 2. Kies, S. J. et al., Anesthesia for patients with congenital long QT syndrome. Anesthesiology, 102(1), 204-210.
- 3. Yaman, F. et al., Anesthesia for a Child with Congenital Long QT Syndrome, a Case Report and Literature Review. Anesthesia, essays and researches, 15(1), 149-151

Learning Points:

- Congenital LQTS demands careful perioperative planning to mitigate arrhythmia risks.
- TIVA is the preferred anesthetic technique to minimize QT prolongation.
- 3. Beta-blockers and appropriate premedication are essential in the perioperative management.
- Ensuring adequate analgesia and monitoring is critical to prevent hemodynamic and ventilatory instability.

22AP02-12

Simplifying pediatric CVC placement: Ketodex and superficial plexus block in Rothmund-Thomson syndrome

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Rothmund-Thomson syndrome (RTS) is a rare genodermatosis with about 300 reported cases in the literature. It includes premature aging, facial rash, predisposition to osteossarcoma, skeletal abnormalities and radial ray defects that can cause airway challenges (1).

This case describes CVC insertion in a 10-year-old RTS patient for prolonged osteossarcoma chemotherapy.

The patient exhibited hallmark features of RTS, including areas of hypo and hyperpigmentation, as well as dental anomalies, high-arched palate and restricted mouth opening. Cooperation was challenging due to the patient's anxiety and developmental limitations. Given the potential airway difficulty, we opted for sedoanalgesia with ketodex and a superficial cervical plexus block.

Standard ASA monitoring including ventilation assessment via nasal capnography was initiated, and oxygen therapy at 2L/min. Ketodex (combination of ketamine 1 mg/kg and dexmedetomidine 1 mcg/kg) was administered as a bolus over 10 minutes. The superficial cervical plexus block was performed under ultrasound guidance using a 26G needle, injecting 10 mL of 2% lignocaine. An initial desaturation episode resolved with supplemental oxygen via a facial mask. The remainder of the procedure occurred uneventfully without the need for additional local infiltration, including cannulation, tunneling and catheter fixation.

Ketodex ensured hemodynamic stability, absence of respiratory depression, analgesia and anxiolysis. Superficial cervical plexus block resulted in blockade of neural conduction in the ventral rami of the C1-4 nerve roots, providing an effective analgesia to CVC cannulation and obviating the need for additional IV sedation or airway manipulation (2). Here we preserved spontaneous breathing and airway patency while providing sufficient analgesia and anxiolysis to ensure procedural success.

We add to the growing body of evidence supporting the use of ketodex, a simple approach offering a safe and effective alternative for CVC placement in complex pediatric cases.

References:

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2.Chauhan S, Baronia AK, Maheshwari A, Pant KC, Kaushik S. Superficial cervical plexus block for internal jugular and subclavian venous cannulation in awake patients. Reg Anesth 1995; 20: 459

22AP03-1

Rare complication of scalp block in pediatric neurosurgery: transient facial nerve palsy

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Background: Scalp block is regional technique used in neurosurgery to block sensory nerves innervating scalp. While routinely employed in adults, use in pediatric is rare. It targets sensory branches of trigeminal nerve greater and lesser occipital nerves. In our pediatric anesthesia clinic, this technique is routinely used to reduce pain during pin placement and scalp incision, decrease opioid use, and early neurological assessment. However, scalp blocks carry risk of complications,including rare facial nerve palsy. Few pediatric cases have been reported.

This article discusses a pediatric case of transient peripheral facial nerve palsy following scalp block, in addition to central facial palsy due to neurosurgery.

Case Report:11-year-old male,weighing 50 kg,presented with 3-month history of headaches and was diagnosed with right parietal AVM. Preoperative evaluations were normal. After premedication with oral midazolam, general anesthesia was induced with propofol (2mg/kg), lidocaine (1mg/kg), fentanyl (1µg/kg), and rocuronium(0.6mg/kg). Scalp blocks were performed using technique described by Pinosky et al.[1] with 1-2 mL of 0.5% bupivacaine mixed with 0.015 mg adrenaline.

Surgery lasted 4 hours without complications and was reversed with sugammadex. Postoperatively, patient exhibited grade 3 left facial paralysis and mild left arm weakness. Imaging studies,temporal CT and MRI, showed no abnormalities. Pediatric neurology diagnosed peripheral facial paralysis and initiated corticosteroid therapy.

Over following two weeks, upper facial paralysis resolved, but lower facial weakness and arm weakness persisted. By one month, all symptoms had resolved, and at a two-month follow-up, the patient resumed normal activities.

Discussion:This case highlights rare complication of peripheral facial nerve palsy following auriculotemporal nerve block during pediatric neurosurgery. Although technique was performed according to established methods, anatomical variations may contribute to complications.

Facial nerve block is typically self-limiting, but it may delay assessment of surgical nerve damage. To minimize complications, volume of anesthetic can be reduced, and injection site adjusted 1 cm above tragus, as suggested by Bebawy et al.(2).

This modification could lower the risk of adverse effects while maintaining effective anesthesia.

References:

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Learning points: Scalp block, Pediatric anesthesia, Facial nerve palsy

22AP03-2

Effect of instillation of intranasal dexmedetomidine on the duration of caudal analgesia in pediatric infra-umbilical surgeries

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Background and Goal of Study: Caudal block is considered gold standard technique of analgesia in paediatric infra-umbilical surgeries due to its ease of placement and lesser adverse effects but the major flaw of single shot caudal block is the short duration which necessitates adjuvants. Dexmedetomidine, a highly specific α_0 agonist, in recent times have been explored as an adjuvant in prolonging the duration of caudal anesthesia. Our research guestion was, does dexmedetomidine, applied via intra nasal route prolong the duration of caudal block in such surgeries.

Primary Objective: To assess first analgesic requirement in the postoperative period

Secondary Objectives: To assess for post-operative sedation (Ramsey score), Readiness for discharge from PACU (Mod. Aldrete score)

Materials and Methods: We conducted a prospective randomized double-blind comparative interventional study. 60 patients among the age of 1-7 years undergoing elective infra-umbilical surgeries were randomised into two groups Group A - Caudal block with 0.25% Ropivacaine (1ml/kg)+ intranasal dexmedetomidine of 1mcg/kg and Group B Caudal block with 0.25% Ropivacaine (1ml/kg)+ intranasal saline. Intraoperative parameters and postoperative (PO) outcomes were recorded.

Patients were assessed on OR table for pain, sedation & PO agitation on extubation. All patients were monitored in post anaesthesia care unit (PACU) for 6 h and in the ward or telephonically till the first analgesic request.

This study was registered in national clinical trial registry of India on 9th September 2021(CTRI/2021/09/036376).

Results and Discussion: Demographic data and duration of surgery were comparable between both groups. No episodes of bradycardia or hypotension were noted in both groups. The mean (SD) time to first analgesic request in Group A was 562.57 ± 126.02 min and was 324.27 ± 81.77 min in Group B, significant prolongation was noted in the intervention group p valve <0.001 (un-paired t-test).

Longer periods of PO sedation (Ramsey score) were noted in Group A but all of the children were easily arousable score, but readiness to be discharged from PACU at end of 6 hours were comparable among the 2 groups.

Conclusion(s): Intranasal dexmedetomidine significantly prolongs the duration of caudal analgesia without any significant adverse events. It also gives a good quality recovery in children after surgery by reducing the incidence of delirium and anxiety in PO period.

22AP03-3

Perioperative management with manual exchange transfusion of a patient with a congenital heart disease and undiagnosed Sickle Cell Disease

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Background: Sickle cell disease (SCD) involves a hemoglobin mutation, where HbS leads to vascular occlusion. Triggers such as hypoxia, acidosis, hypothermia, and low blood flow during cardiac surgery can provoke a sickle cell crisis. This report highlights the perioperative management of a 5-year-old girl with undiagnosed SCD undergoing atrial septal defect closure, emphasizing manual exchange transfusion as an alternative to automated exchange or simple transfusion.

Case: A 5-year-old, 15-kg girl from a developing country presented with SCD (82% HbS) and atrial septal defect. Initial anemia (Hb 6.9 g/dL) was clinically tolerated, with normal neurological, abdominal, and hepatosplenic findings. A simple blood transfusion (15-20 mL/kg RBC) was administered at 2 mL/kg/h due to Hb <7 g/dL. Continuous monitoring of blood counts, reticulocytes, and HbS levels followed. Under general anesthesia, femoral artery and right internal jugular vein access were obtained, while peripheral venous access in the lower extremities was avoided. Prophylactic antibiotics and tranexamic acid were given. Manual exchange transfusion was initiated: the first 10 mL/kg (150 mL) of blood was replaced with saline, followed by 30 mL/kg (450 mL) of RBC in two sessions. Calcium and glycemia were monitored every 30 minutes. Dopamine and milrinone ensured hemodynamic stability, and 10 mL/kg plasma was transfused. Post-surgery, the patient was extubated within 2 hours, with HbS reduced to 15% and no complications.

Discussion: Blood transfusion is critical in preventing strokes in SCD patients. The optimal transfusion method is debated. Simple transfusions raise ferritin levels (250 mg iron/unit RBC), increasing risks of liver cirrhosis, myocardial dysfunction, and mortality. Automated RBC exchange reduces ferritin levels but requires costly equipment and specialized personnel, limiting its accessibility. Manual exchange transfusion offers a practical alternative, mitigating ferritin-related risks and being feasible in resourcelimited settings.

Learning Points:

- · Anesthetic management of SCD in congenital heart disease.
- Practical application of manual exchange transfusion.

Reference:

Schwartz J et al. Guidelines on the use of therapeutic apheresis in clinical practice-evidence-based approach from the Writing Committee of the American Society for Apheresis: the sixth special issue. J Clin Apher [Internet]. 2013 Jul;28(3):145-284.

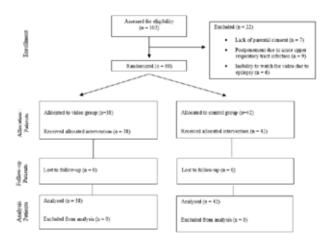
22AP03-4

Short video viewing for preoperative anxiety and post-procedure recovery in the pediatric endoscopy unit: a prospective randomized study

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Background and Goal of Study: This study aimed to evaluate the impact of watching short videos on social media as a nonpharmacological intervention for reducing preoperative anxiety and its effect on recovery time in pediatric patients undergoing endoscopic procedures.

Materials and Methods: This prospective, randomized study was conducted in a tertiary care pediatric endoscopy unit. 102 patients were screened for eligibility between September 17 and November 27, 2024. A total of 22 patients were excluded, leaving 80 children who were randomly assigned to the video (Group V) or control (Group C) group. The primary outcome was anxiety scores, assessed using the Modified Yale Preoperative Anxiety Scale (mYPAS) at four-time points: upon arrival in the waiting room (T1), just before entering the operating room (T2), upon entering the operating room (T3), and during anesthesia induction (T4). The secondary outcome was recovery time, measured from the end of the procedure until the Aldrete score reached 9 or higher. Statistical analyses were conducted to compare anxiety scores and recovery times.

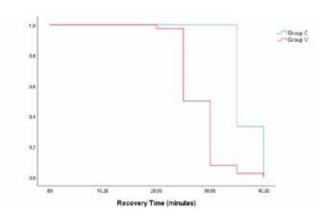


Results and Discussion: mYPAS scores were comparable at T1 (P=0.969); however, at T2, T3, and T4, Group V demonstrated lower scores than Group C (P < 0.001). mYPAS scores stayed relatively consistent in Group V, whereas they increased significantly over time in Group C (P < 0.001). Recovery times were shorter in Group V (p<0.001).

Comparison of The Perioperative mYPAS Scores

	Group V (n=38)	Group C (n=42)	p
mYPAS			
T1	39.9 (3.3) ^a	39.9 (5) ^a	0.969
T2	28.6 (3.3)b	43.2 (5)b	< 0.001
T3	35 (4.5)°	49.8 (4.1)6	< 0.001
T4	36.7 (4)4	53.9 (4.6)8	< 0.001
p	< 0.001	< 0.001	

mYPAS, modified Yale Preoperative Anxiety Scale. Data are expressed as median (interquartile range). +No significant difference was observed between measurement times with the same letter in within-group compa Entrance to the waiting room (T1), before being taken to the procedure room (T2), upon entering the procedure



Conclusion: Watching short videos on social media reduces preoperative anxiety and recovery time in pediatric patients undergoing endoscopic procedures.

22AP03-5

Retrospective evaluation of demographic characteristics, types of surgical procedures, postoperative hospitalization and mortality rates of pediatric patients undergoing surgery under general anesthesia

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Background and Goal of Study: The risk of anesthesia is higher in pediatric patients than in adults, and this risk increases inversely with the age of the pediatric patient. This study aims to determine the gender and age group distribution, the most common surgery procedures, and to define the postoperative length of stay and mortality rates in patients operated on by pediatric surgery.

Materials and Methods: The data of patients who underwent pediatric surgery in the period from 01.01.2022 to 31.12.2022 were obtained from hospital digital database after university IRB approval (24.10.23, SBA-23/243). Gender, age at the time of the operation, type of the surgical procedure, the number of surgeries each patient undergone, postoperative hospitalization, the length of stay (LOS), and mortality within 30 days postoperatively were recorded.

Results and Discussion: The study encompassed 1,553 surgical procedures performed on 1,274 patients (70.7% male and 29.3% female) under the age of 18 who underwent surgery under general anesthesia. The most common age group for surgery was young children (4-12 years) (49.0%) and the least common was neonates (2.3%). The most common surgical procedure was abdominal surgery (21.7%) and the least common was trauma surgery (0.1%).

Postoperatively, 810 (52%) were hospitalized. Toddlers (57.2%) and children of walking age (53.4%) were most frequently admitted to day surgery, while neonatal group (8.6%) was the least. Of the 35 neonates, 32 (91.4%) were hospitalized with a mean LOS of 11 days.

The hospitalization rate was significantly higher in neonates (p<0.001). The longest LOS was found in neonates (p<0.001). Postoperative 30-day mortality was evaluated for medium/highrisk surgeries in which body cavities such as the abdomen and/or thorax were opened, as well as, tumor and port procedures. In this group, 30-day mortality rate was 10/655 (152 per 10.000). There was no significant correlation between mortality and gender and number of previous operations.

Hospital mortality was significantly higher in neonatal surgeries (OR=10.221; 95% CI: 2.561-40.797, p<0.001). As the LOS prolonged, the likelihood of hospital mortality continued to rise significantly (OR=1.015: 95% CI: 1.002-1.028, p=0.029).

Conclusion(s): In our study, neonates undergoing surgeries under general anesthesia had the highest rate of postoperative hospitalization, the longest postoperative stay and highest mortality rate.

22AP03-6

VA-ECMO as a lifeline: managing severe intoxication after speedball

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Background: Speedball, a combination of an opioid and a stimulant (cocaine or methamphetamine), is associated with high mortality due to respiratory and cardiac arrest.

This case highlights the rare occurrence of severe speedball intoxication in a pediatric patient requiring extracorporeal membrane oxygenation(ECMO).

Case Report: A 15-year-old female presented to the emergency department in a comatose state with clinical signs of shock. She was intubated and admitted to the pediatric intensive care unit. Physical examination revealed fever, nuchal rigidity, positive Kernig and Brudzinski signs, and ecchymotic and cyanotic skin lesions. Laboratory findings indicated elevated creatinine, thrombocytopenia, and severe metabolic acidosis. Toxicology screening confirmed significant elevations in amphetamine, methamphetamine, ketamine and lidocaine levels. Initial management included broad-spectrum antibiotics for presumptive septic shock, highdose vasopressors, and aggressive fluid resuscitation.

Despite these interventions, the patient remained in refractory shock. Femoral veno-arterial ECMO was initiated two hours postadmission, along with intravenous lipid emulsion therapy for intoxication management. On day 6, worsening renal failure and severe acidosis necessitated the initiation of continuous renal replacement therapy. Neuroimaging on day 7 revealed an intraparenchymal hematoma, prompting decompressive craniectomy. Transcalvarial herniation necessitated a fronto-temporo-parietal lobectomy. Despite maximal therapeutic efforts, the patient succumbed to meningococcal meningitis and vasopressor-resistant septic shock on postoperative day 10.

Discussion: This case presentation highlights the potential utility of VA-ECMO in managing severe intoxication with hemodynamic instability. While data on ECMO use in poisoning remains limited1, this case underscores its potential role as a bridge to definitive therapy by maintaining adequate perfusion. Notably, this case exemplifies the rare presentation of severe pediatric speedball intoxication leading to multi-organ failure, intracranial hemorrhage, and superimposed sepsis. While ECMO is a potential salvage therapy for adult drug intoxication, its use in critically ill children presents unique challenges and requires further study.

References:

1. Hackl G, Schreiber N. Extracorporeal treatment in poisoning. Med Klin Intensivmed Notfmed, 2024

Learning points: VA-ECMO can stabilize hemodynamically unstable patients in severe intoxication cases.

22AP03-7

A tailored approach to paediatric airway management: lessons from a Goldenhar syndrome case

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Background: Goldenhar syndrome (oculo-auriculo-vertebral spectrum) results from a developmental disturbance in the first two branchial arches, that leads to craniofacial and vertebral anomalies that pose challenges in ventilation and intubation. Patients may have cardiac and renal defects of varying severity.1 Difficult airway management in children is particularly complex due to their higher oxygen consumption and limited cooperation in awake intubation.2

This case report describes a successful orotracheal intubation in children with Goldenhar syndrome.

Case Report: An 8-year-old female patient, ASA III, was scheduled for bone-anchored hearing aid implantation under general anesthesia. Preoperative physical exam revealed right-sided hemifacial microsomia with ear atresia and mandibular hypoplasia, resulting in limited mouth opening, a narrow oral cavity, and marked retrognathism. There was no history of other medical disorders. Laboratory tests were unremarkable.

After parental consent, the patient was transferred to the OR and monitored using ASA standard measurements, with additional monitoring of neuromuscular function and anesthesia depth.

Spontaneous ventilation was maintained with propofol boluses. An initial attempt with videolaryngoscopy was unsuccessful. A bronchofibroscopy was associated to guide our approach and, despite marked airway structure distortion, careful technique and patience, led to successful intubation.

The child was maintained on TIVA and the procedure went uneventfully. She was extubated once fully awake in the OR, recovered without complications and was discharged after 2 days.

Discussion: Goldenhar syndrome is linked to predictable difficult airway. The ESAIC-BJA new guidelines aim to address this gap in paediatric anticipated difficult airway management; however, they emphasize the need for adaptation, as there is no "one size fits all".3

In our case, combining videolaryngoscopy and bronchofibroscopy while maintaining spontaneous ventilation ensured safe intubation, emphasizing that adequate preparation and adaptability are essential. Trained anesthesiologist in paediatric airway management is also a crucial key to success.

References:

1. Lalwani K, Pediatric Anesthesia: A Problem-Based Learning Approach 2018: p521-532

2.Chin Med J. 2017 Dec 5;130(23):2881-2882

3.EJA 41(1):p 3-23, Jan. 2024

Learning points: This case underscores the need for tailored, innovative approaches to ensure a safe managing in difficult airways in children.

22AP03-8

Mastering anesthesia: a delicate dance with osteogenesis imperfecta – a case report

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Background: Osteogenesis imperfecta (OI) is a group of hereditary disorders primarily characterized by bone fragility and is the most common cause of heritable bone weakness. It is associated with significant anatomical and physiological abnormalities, including mitral valve prolapse, a predisposition to malignant hyperthermia, abnormal cervical spine mobility, and an increased risk of mandibular and facial fractures.

These complexities present unique challenges for anesthetic management, requiring meticulous planning and care to ensure patient safety.1,2

Case Report: We present the case of an 11-year-old male with OI, ASA III, who underwent intramedullary nailing of the cubital bone due to an infected fracture osteosynthesis. His clinical features included short stature, blue sclerae, a barrel-shaped chest, and thoracodorsal kyphoscoliosis. He had no additional comorbidities.

The procedure was performed under balanced general anesthesia using sevoflurane, with the placement of a second-generation supraglottic airway (SGA). Special attention was given to gentle SGA placement to avoid cervical spine manipulation, and meticulous patient positioning was maintained to prevent fractures or soft tissue injury.

The surgery proceeded smoothly, without major complications or significant fluctuations in vital signs, and the patient experienced a successful, uneventful recovery.

Discussion: This case hopes to demonstrate a successful intervention in a patient with OI under balanced general anesthesia with sevoflurane, using a second-generation SGA. It also underscores the critical importance of a meticulous, multidisciplinary approach to anesthetic management in these patients to ensure optimal outcomes.

References:

- 1. Meena Balasubramanian. Osteogenesis imperfecta: An overview. In: UpToDate, Connor RF (Ed), Wolters Kluwer. (Accessed on November 20, 2024.).
- 2. Gupta D, Purohit A. Anesthetic management in a patient with osteogenesis imperfecta for rush nail removal in femur. Anesth Essays Res. 2016 Sep-Dec;10(3):677-679.

Learning points: It is essential to adopt a flexible anesthetic and surgical approach when managing rare diseases with potentially severe anesthetic implications, guided by the best available scientific evidence and a thorough understanding of the disease's relevant pathophysiological features.

22AP03-9

Day-case paediatric anesthesia for dental surgery in children with autism spectrum disorder

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Background: Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder. Social ties and interactions are persistently disrupted, communication difficulties, stereotyped behavior, and unusual responses to sensory stimuli occur, there are characteristic aggression, hysteria, self-harm. This makes it difficult to perform dental procedures in awake patients with ASD and requires the choice of anesthesia.

Case Report: Under our observation in 2022-2024 there were 87 patients aged 3 to 17 years with ASD, who required significant and very significant support (DSM-5). Patients underwent outpatient sanitizing dental interventions for infections of the teeth, periodontium and paranasal sinuses.

Discussion: Our local protocol for the anesthetic support is based on our experience and analysis of literature data [1]. The main rules on the day of surgery are: ensuring the maximum presence of the patient's parents (guardians) in the perioperative period; exclusion of a delay in the start of the surgery and the patient's waiting time in the clinic; support of the observance of the patient's household habits and taking the usual medications; minimization of sensory stimuli (light, sound) and the number of personnel involved in the procedure.

All of our patients received oral midazolam (0.5 mg/kg) 15 min. before the start of the procedure. Sedative effect (deep sedation) developed during 5-10 min. and lasted 35-45 min. After reaching a sufficient level of sedation, patients underwent peripheral vein catheterization. If it was necessary to potentiate sedation (37% of patients), we used intravenous administration of ketamine 0.1-

For patients monitoring we used a pulseoximeter, capnograph, and electrocardiogram. When deeper anesthesia was needed (17% of patients), we used induction with intravenous propofol 2-3 mg/kg.

For maintain of anesthesia we used propofol infusion 9-15 mg/ kg/h. Oxygen support was given through nasal cannulas. Also we used regional anesthesia with 2% lidocaine/adrenaline 1:100000. After reaching an adequate level of awakening, we practice fast discharge of patients from the clinic and their telemedicine support if it was necessary.

Reference:

1. Vallogini G, et al. Conscious Sedation in Dentistry for the Management of Pediatric Patients with Autism: A Narrative Review of the Literature. Children (Basel). 2022 Mar 24;9(4):460. Learning points: This approach provided for patients with ASD effective and safe sedation for dental surgery.

22AP03-10

A case of complex congenital heart disease posted for non-cardiac surgery: An extremely rare challenging case

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Background: We report a rare case of tricuspid atresia, hypoplastic left ventricle, unrestricted ostium secundum atrial septal defect, a large inlet ventricular septal defect, malposition of the great arteries, with aorta arising from the right ventricle, and a large patent ductus arteriosus (PDA), discussing the anesthetic management of the patient scheduled for non-cardiac surgery.

Case Report: An 8 month old female child, a follow-up case of necrotizing enterocolitis and a double-barrel stoma, along with complex congenital heart disease (CHD), was scheduled for stoma closure. On physical examination, the child presented with cyanosis, blood oxygen saturation of 73%, and a continuous grade III murmur on auscultation.

Laboratory investigations revealed hemoglobin level of 19g/dl and hematocrit of 61.2%. Intraoperatively, patient was induced with intravenous(IV) fentanyl, ketamine, and atracurium. An arterial line was placed in the left radial artery for strict blood pressure monitoring.

Analgesia was provided via caudal anesthesia and IV paracetamol. To maintain baseline systemic vascular resistance(SVR), phenylephrine infusion was initiated at 0.05-1.5mcg/kg/min to keep blood pressure within the 50th-90th percentile for the patient's age.

During the procedure, the patient remained hemodynamically stable. At the end of procedure, she was extubated and shifted to postoperative recovery room

Discussion: This case report demonstrates the intricate anesthetic management of patient with PDA dependent complex congenital heart disease. Pulmonary stenosis or disruption in the flow through a PDA can result in pulmonary hypoperfusion and progressive hypoxemia1.

In our case, pulmonary perfusion was dependent on heart rate²

The primary objective of our management was to prevent complications associated with complex CHD and maintain stable hemodynamics.

References:

- 1. Tyagi S et al. Stent implantation in right sided patent ductus arteriosus to relieve severe cyanosis in adult patient with pulmonary atresia and ventricular septal defect. Catheter Cardiovasc Interv.2004 Feb;61(2):271-4.
- 2. Ueda N et al. Anesthetic management of pheochromocytoma associated with tricuspid atresia. Can J Anaesth. 1991 Sep;38(6):780-4.

Learning points: Pediatric population with uncorrected CHD presents significant challenges. However, understanding the pathophysiology of the disease, meticulous management, appropriate use of drugs, and stringent monitoring can lead to a safe outcome.

22AP03-12

Analgesia for paediatric hip dysplasia surgery in the under 6 age group: a single centre 8-year experience

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Background and Goal of Study: Analgesia for hip dysplasia surgery (femoral osteotomy or open hip reductions) varies significantly between institutions (1). Traditionally our service used epidural/caudal infusions for post-operative analgesia, requiring admission to high dependency unit (HDU). Due to reduced HDU bed availability during the COVID-19 pandemic, single-shot neuraxial techniques (spinal, epidural, or caudal injections) became more common. This retrospective service evaluation compares outcomes of patients with caudal/epidural infusions to those without infusion.

Materials and Methods: We reviewed patients aged under 6 years of age from October 2015 to August 2024. Data on analgesic technique, epidural/caudal infusion duration, nurse/patientcontrolled analgesia (NCA/PCA) usage (morphine 20 micrograms/kg/ml), length of stay and pain scores were collected. All patients received oral analgesics.

Results and Discussion: We identified 46 patient episodes. 42 patients were ASA 1, 4 were ASA 2. Analgesic techniques used were epidural infusion (n=13), caudal infusion (n=22), single shot caudal injection (n=6), spinal injection (n=1) and caudal catheter inserted but removed at the end of surgery (n=4). Neuraxial infusions were used for a mean duration of 1.6 days. Results are presented in Table 1.

Pain scores were similar in both groups. There was lower mean NCA/PCA dosage in the non-infusion group which may be secondary to reduced length of stay.

	Mean age (years) (range)	Mean weight (kg) (range)	NCA / PCA use (%)	Mean NCA / PCA dose (mL) (range)	Mean length of stay (days) (range)	Mean worst pain score (recovery) (range)	Mean worst pain score (ward) (range)	Nausea / vomiting (%)
Neuraxial infusion (n=35)	1.6 (0-5)	11.1 (7.7-16.7)	20	22.8 (0-77)	2.9 (1-13)	0.2 (0-5)	3.5 (0-7)	32
No neuraxial infusion (n=11)	2 (0-5)	13.5 (7.7-21.6)	64	14.75 (0-28)	1.5 (1-2)	0 (0-0)	3.6 (0-8)	27

Table 1.

Conclusion(s): Single-shot neuraxial injections given intra-operatively are an acceptable alternative to post-operative caudal/ epidural infusions and may even lead to better outcomes in the form of reduced HDU admissions, NCA/PCA dosage, nausea and vomiting and overall length of stay for children under 6 years undergoing hip dysplasia surgery.

Reference:

1. Aksu C, Cesur S, Kuş A. Pericapsular nerve group (PENG) block for postoperative analgesia after open reduction of pediatric congenital dysplasia of the hip. J Clin Anesth. 2020 May;61:109675. doi: 10.1016/j.jclinane.2019.109675. Epub 2019 Dec 1. PMID: 31796372.

22AP04-1

From womb to cath-lab: Anesthetic management for balloon atrial septostomy within two hours of birth

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Background: Balloon Atrial Septostomy (BAS) is an emergent life-saving intervention for cyanotic neonates with dextro-Transposition of the Great Arteries (d-TGA) and restrictive atrial sep-

This report presents a 2 hours-old neonate who was timely and effectively given perioperative anesthesia care for BAS and consequently able to live to have arterial switch operation (ASO).

Case Report: Classified as ASA IVE, the patient was one of antenatally diagnosed male twins, born by planned cesarean section at 36 weeks, weighing 2690 grams. Prostaglandin-1 infusion was initiated immediately after birth. He was transferred to the pediatric cardiac intensive care unit with blood oxygen saturation (SpO2) of 70% on continuous positive airway pressure.

The initial echocardiography showed d-TGA, patent ductus arteriosus and a 1.5 mm restrictive atrial level communication. Presenting deepening hypoxaemia and acidosis, he was taken to the catheterization laboratory (cath-lab) for BAS 1.5 hours after his birth. Cath-lab temperature was maintained at 29°C.

Before induction while on adrenaline and dextrose infusions, haemodynamic monitorization showed his SpO2 was 22%, heart rate was 120 beats/min, blood pressure was 70/35 mmHg. He was uneventfully intubated. Near-infrared spectroscopy cerebral oxygenation showed 54%.

Mild hyperventilation was applied. His SpO2 raised to 55% after intubation and to 91% after placement of balloon catheter. The echocardiography after BAS showed a 6.5 mm atrial communication, allowing adequate intercirculatory mixing. He was extubated the next day and scheduled for ASO the following week.

Discussion: Restoring adequate systemic perfusion of severely cyanotic patient can call for BAS1 and its perioperative anesthetic management, which starts with preoperative collaboration with the pediatrics team, includes intraoperative interventions to maintain cardiac output while keeping a lower pulmonary vascular resistance than systemic vascular resistance¹ and extends to postoperative follow up.

Reference:

1. Sarris GE Chairperson Greece, Balmer C Switzerland, Bonou P Greece, et al. Clinical guidelines for the management of patients with transposition of the great arteries with intact ventricular septum. Eur J Cardiothorac Surg. 2017;51(1):e1-e32. doi:10.1093/ ejcts/ezw360

Learning points: The quick collaboration across disciplines and a well prepared experienced pediatric cardiac anesthesiology team are crucial for perioperative care for BAS.

22AP04-2

Incidence of and risk factors for acute kidney injury in neonates with congenital diaphragmatic

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Background and Goal of Study: Congential diaphragmatic hernia (CDH) is a severe congenital malformation requiring surgery in the neonatal period. The reported mortality is 25-30%, often due to severe pulmonary hypertension. Neonates with CDH are exposed to several risk factors for acute kidney injury (AKI), including strict fluid restriction. Still, data on the incidence of AKI is sparse in this group of patients.

Our aim was to investigate the AKI incidence and identify modifiable risk factors for AKI development in a cohort of CDH-patients thoroughly characterized in physiological/clinical variables.

Materials and Methods: This was a retrospective cohort study from a tertiary pediatric referral center for CDH patients. CDH patients born January 2015-May 2022 with birth weight ≥2 kg, GA ≥32 weeks and invasive ventilation initiated within 2 days were included. Patients with congenital kidney disease and patients who died within the first 2 days were excluded.

The primary outcome was frequency of AKI according to the KDIGO definition. Patients with complete data from day 1 were included in a step-wise forward regression analysis of risk factors

Results and Discussion: Out of 109 patients, 31 (28%) developed AKI. Among AKI patients 17 (55%) had stage 1, 1 (3%) stage 2 and 13 (42%) stage 3 AKI. The AKI incidence was higher in ECMO patients compared to non-ECMO: 15/24 (62%) and 16/85 (19%), respectively (p<0.0001). Thirteen (42%) AKI patients received CRRT, 12 of these during ECMO treatment.

On admission, PIM-3 score was higher in the AKI group compared to no AKI patients, 17 (13-26) and 12 (9.2-16), respectively (p=0.0001). ECMO treatment was required in 24/109 patients (22%). In included patients, the mortality was 6/109 (5.5%).

In multivariate analysis of risk factors prior to AKI development (n=100), the duration of hyperchloremia (p=0.0006), peak Oxygenation Index (OI)(p=0.02) and peak Vasoactive-inotropic score (VIS)(p=0.0004) were significantly associated with AKI. Using the KDIGO definition there was complete resolution of AKI at PICU discharge in all surviving patients.

Conclusion(s): AKI is common in CDH patients. Duration of hyperchloremia prior to AKI development was found to be a potentially modifiable risk factor for AKI.

The impact of OI and VIS likely reflects renal effects of the hypoxic respiratory failure and severe hemodynamic effects related to CDH. In this study, AKI had resolved at PICU discharge in all surviving patients.

22AP04-3 **MDMA** intoxication

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Background: intoxication with 3,4 methylenedioxymethamphetamine (MDMA), commonly known as "ecstasy," although rare in children, represents a potentially serious medical emergency. This substance, primarily used recreationally by adults, can be accidentally ingested by children, who are exposed to toxic doses due to their low body weight and immature metabolism. These intoxications are often characterized by severe symptoms such as seizures, hyperthermia, or multiorgan failure, requiring prompt and appropriate management.

With the rising number of reported cases, it is crucial to better understand the clinical features and therapeutic strategies to improve prevention and treatment.

Case Report: This case involves a 13-month-old male infant with no significant medical history, admitted to the pediatric emergency department of the Mother-Child Hospital at CHU Ibn Rochd in Casablanca for generalized tonic-clonic seizures, complicated by status epilepticus.

These symptoms occurred following the accidental ingestion of MDMA. The diagnosis was confirmed through the patient's history, supported by law enforcement officials who brought the child in and reported the discovery of MDMA tablets at the scene.

The child was admitted to the pediatric intensive care unit due to his comatose state. Upon admission, a comprehensive biological workup was conducted to assess metabolic parameters and identify potential complications.

Discussion: This case highlights the potential severity of MDMA intoxication in children, emphasizing the importance of prompt recognition of clinical signs and appropriate management. Neurological instability and systemic complications observed in such cases require urgent intervention to prevent fatal outcomes. Early intubation, sedation, and hemodynamic support are crucial in these situations.

This incident also underscores the need to strengthen preventive measures, particularly by raising awareness among families about the dangers of accidental exposure to psychoactive substances. A multidisciplinary approach, involving pediatricians, toxicologists, and intensive care teams, is essential to optimize the chances of full recovery and reduce the risk of long-term sequelae.

22AP04-4

Intraoperative physiologic interventions associated with postoperative neurological complications in neonates: a secondary analysis of the NECTARINE registry

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Background and Goal of Study: Neonates and infants are at risk for severe postoperative neurologic complications following anaesthesia. The exact cause of these neurologic complications is unknown, but intraoperative physiologic disturbances have been suggested to play a role in the aetiology.

The objective of this study was to assess the relationship between unexpected intraoperative instability of systemic homeostasis necessitating a corrective action and the development of postoperative neurological complications in neonates undergoing operative and non-operative procedures.

Materials and Methods: Data for this secondary analysis were extracted from the NECTARINE registry: a prospective cohort of neonates up to 60 weeks postmenstrual age from 165 participating centres in 31 countries. The primary outcome was a binary measure indicating the development of any neurological complication up to 30 days postoperatively.

Neurological complications included: hypertonia (new onset), hypotonia (new onset), intracranial bleeding (ultrasound, CT, or MRI), intracranial ischemia (ultrasound, CT, or MRI), and occurrence of seizures (clinically or EEG).

Exposures of interest were binary indicators of unexpected intraoperative instability of systemic homeostasis necessitating a corrective action. Descriptive statistics were calculated, and a multivariable logistic regression model was fit using complete case analysis.

Results and Discussion: 140/5,504 (2.5%) neonates developed a postoperative neurologic complication; of those with a neurologic complication, 40.7% experienced at least one episode of intraoperative hypotension which necessitated corrective action. In a multivariable analysis, no exposures of interest were significantly associated with the outcome (Table 1).

	N (%) among cases withour nesteologic complication(i)	N (%) among cases with noneologic complication(s)	Adjusted odds ratio (aCR)	95% confidence interval (CI)	P value
learn entten for:					
Typocapous or Trypeerapean	464 (5.7%)	23 (16.4%)	1.00	(0.60,1.67)	0.990
Hypotessou	1.132 (21.1%)	57 (40:7%)	1.33	(0.89, 1.99)	0.160
Oradycardia or tarityenrdia	122 (2.3%)	11 (2.9%)	1.70	(0.53,3.51)	0.149
Hyperplycaessus	31 (1.0%)	3 (2.1%)	1.02	(0.28.3.73)	0.972
Hypoglycomia	104 (1.9%)	4 (2.9%)	0.63	(0.21,1.83)	0.394
Hypernatremia	8 (0.2%)	1 (0.7%)	2.43	(0.22,26.82)	0.470
Hypoustrema	14 (0.3%)	2 (1.4%)	1.23	(0.18.8.32)	0.832
N .	5,364	146	5,504		

Table 1. Results from bivariate and multivariable analyses of neurologic complications.

Conclusion(s): In this retrospective study of neonates undergoing operative and non-operative procedures, there was no association between unexpected intraoperative instability of systemic homeostasis necessitating a corrective action and subsequent neurologic complications.

Acknowledgements: Funding for the NECTARINE study was provided by ESAIC (ESAIC_CTN_NECTARINE).

22AP04-5

Anesthesia for pediatric radiotherapy and its effect on patient outcomes

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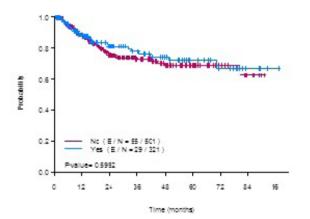
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Background and Goal of Study: Patient motion poses significant challenges for accurate delivery of radiotherapy. In younger children limited to no motion is often accomplished by performing treatments under general anesthesia (GA). In children undergoing proton beam therapy (PBT), this may require up to 30 treatments under GA over a period of 6 to 8 weeks.1

To date, the impact of this many iterative anesthetic (IA) exposures on the short and long-term outcomes of children undergoing PBT remains unclear. The primary objective of this study was to assess the association between IA exposure and the occurrence of an unplanned admission (UA) or emergency room (ER) encounter within 30 days of treatment start. The secondary objective assessed the impact of IA on overall survival (OS).

Materials and Methods: Retrospective study of children (≤ 19 yrs.) who had undergone PBT (with or without anesthesia). Multivariable logistic regression was used to assess factors associated with an UA and survival.

Overall Survival by Froton with Anesthesia



Results and Discussion: The average age of the 822 children was 9.3 yrs. (SD±5.2). The majority 458/822 (55.7%) were female, and 501/822 (60.9%) had undergone PBT without anesthesia. The group who underwent PBT under IA were younger (4.4 yrs. vs. 12.4 yrs., p<0.001), and had higher proportions of treatment interruptions (55.5% vs. 44.3%, p=0.001), chemotherapy history (41.1% vs. 9.8%, p<0.001), and UA/ER encounters (12.5% vs. 1%, p<0.001).

In the multivariable analysis, IA (OR, 13.91: 95%CI, 5.39-35.85: p<0.001), concurrent chemotherapy (OR, 2.69: 95%Cl, 1.39-5.24: p=0.004), and treatment interruptions (OR, 1.97; 95%Cl, 1.02-3.89: p=0.045) were each associated with increased odds of an UA/ER encounter. However, there was no difference in OS rates (IA vs. no-anesthesia) at 1yr (88% vs. 87%), 3 yrs. (81% vs. 75%), or 5yrs. (73% vs. 77%), p=0.599.

Conclusion(s): In this retrospective study, undergoing PBT under anesthesia was associated with an increased risk of an unplanned admission or emergency room visit within 30 days of treatment start. However, there was no association between anesthesia exposure and patient survival.

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22AP04-6

Pulmonary hypertensive crisis following release of lung torsion: a case report

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Background: Lung torsion is an extremely rare postoperative complication of MICS (minimally invasive cardiac surgery), Pulmonary hypertensive (PH) crisis is characterized by acute elevation of pulmonary vascular resistance, accompanied by decompensation of right ventricular systolic function.1

We experienced a PH crisis precipitated by alveolar hypoventilation as a result of airway obstruction by massive hemosputum following release of lung torsion.

Case report: A 4-year-old boy underwent MICS via a right minithoracotomy for ventricular septal defect. Postoperative progression of anemia and chest CT suggested pulmonary hemorrhage. An exploratory re-thoracotomy revealed no apparent cause. The boy was transferred to a tertiary facility for further evaluation on POD8. Surgery was performed the following day under general anesthesia with one-lung ventilation by a bronchial blocker in the right main bronchus.

Preoperative transoesophageal echocardiography (TEE) suggested elevated right ventricular systolic pressure, with no blood flow in the right upper pulmonary vein. The superior and middle lobes of the right lung were rotated. Upon detorsion, tidal volume, SpO_a, and blood pressure dropped, with a D-shaped left ventricle on TEE indicating an acute increase in right ventricular preload. Hemosputum had overflown the bronchial blocker, causing alveolar hypoventilation, triggering a PH crisis. Repetitive suctioning of bloody secretions from the trachea greatly improved ventilation and helped stabilize hemodynamic fluctuations. The superior and middle lobes of the right lung were resected, and the boy made a smooth recovery.

Discussion and Learning points: We experienced a case of lung torsion following MICS VSD repair. Despite placement of a bronchial blocker and ligation of the pulmonary vessels prior to detorsion, hemosputum expectorated from the rotated lung lobes obstructed the airway, overloaded the right ventricle and precipitated a PH crisis. Availability of devices for one-lung ventilation in pediatric patients is limited. Bronchial blockers require careful management of placement and sealing effectiveness.

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22AP04-7

Long-term risk of chronic kidney disease after pediatric CRRT in the PICU - data from the Swedish National Patient Register

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Background and Goal of Study: Continuous renal replacement therapy (CRRT) is the preferred therapy for critically ill children with severe acute kidney injury (AKI) or multiple organ failure (MOF) with fluid overload (FO). Mortality in this cohort is high, but the longterm risk for chronic kidney disease (CKD) in survivors is unclear. Also, risk factors for the development of CKD are unknown, and there is no consensus regarding post-ICU follow-up.

We aimed to describe the long-term risk of developing CKD after CRRT in the PICU, and to identify risk factors for CKD development.

Materials and Methods: This was a register-based study from a tertiary pediatric centre. Patients 0-18 years old receiving CRRT due to AKI or MOF with FO between 2008-2021 were included if they survived PICU stay.

The primary outcome was frequency of CKD diagnosis in the national register. PICU data was collected from patient charts. Patients diagnosed with CKD, hypertension or kidney transplantation after ICU discharge were identified through the Swedish National Patient Register.

Results and Discussion: 156 patients were included. Median age at CRRT initiation was 3.5 months (IQR 0-69). Twenty-one (13.5%) patients were diagnosed with CKD after ICU discharge. Median follow-up time was 8.7 years in patients with CKD and 6.3 years in no-CKD patients (p=0.04). AKI as indication for CRRT was significantly more common in the CKD group (95.3% vs 67.4%, p<0.01).

Moreover, in the CKD group severe AKI (KDIGO stage 2-3) at CRRT initiation was more frequent (90.5% vs 64.4%; p=0.02) and GFR at hospital discharge was lower (38.5 vs 82.1 ml/min/1.73 m², p<0.01) compared to the no-CKD group. However, the no-CKD group was younger at CRRT initiation (p=0.01) and had higher PIM-scores (p=0.01). During follow-up, hypertension occurred in 11.5% of patients and 1.9% needed a kidney transplant.

Variable	All patients (156)	No CKD (135)	(21)	P-value	
Age at CRRT initiation, months	3.5 (0-69)	1 (0-62)	48 (7-133.5)	0.01	
PIM-3, PDR (%), n=152	22.4 (8.3-54.4)	25.1 (9.9-60)	8.6 (3.8-30)	< 0.01	
KDIGO stage at CRRT initiation - 0-1 - 2-3	50 (32.1) 106 (67.9)	48 (35.6) 87 (64.4)	2 (9.5) 19 (90.5)	0.02	
GFR at hospital discharge	76.1 (45.3-107.6)	82.1 (52.4-120.3)	38.5 (20.9-65)	< 0.01	
CRRT indication (%) - AKI - MOF	111 (71.2) 45 (28.8)	91 (67.4) 44 (32.6)	20 (95.3) 1 (4.7)	<0.01	

All values are presented as n (%) or as median (interquartile range). P values are calculated by Fisher exact test or Mann-Whitney U test. CKD+chronic kidney disease, CRRT+continuous renal replacement therapy, PIM+pediatric index of mortality, PDR+predicted death rate, KDIGO+kidney disease improving global outcome, GFR-glomerular filtration rate.

Table 1.

Conclusion(s): In this long-term follow-up using a national diagnosis register 13.5% of patients developed CKD. CKD development was associated with more severe AKI, but not with severity of disease or low age. Adequate post-ICU follow-up is important for pediatric CRRT patients, especially for those with severe AKI.

22AP04-8

Efficacy and safety of an ultrasound guided single shot paravertebral block in reconstruction of oesophageal atresia in neonates

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Background and Goal of Study: Neonates with oesophageal atresia (OA) needs surgery early in life and hence appropriate peri- and postoperative pain treatment. In our institution primary repair of OA is performed with a right-sided thoracotomy. A single shot paravertebral block (sPVB) is administrated before thoracotomy. The use of sPVB has several benefits including reduced need for general anesthetics, reduced surgical stress response, reduced opioid analgesia and shorter postoperative recovery time. However, the efficacy and risks of using sPVB in neonatal OA surgery has not previously been described.

The primary aims were to investigate if sPVB reduced the perioperative opioid consumption and postoperative time on mechanical ventilation. Secondary aims were the rates of sPVB complications, length of PICU stay and need of pain treatment at PICU discharge.

Materials and Methods: Retrospective study including 30 neonates undergoing repair of OA. The patients were divided in two groups based on the type of pain treatment received during surgery, sPVB or opioid based intravenous therapy (IV). The sPVB was performed after induction using an ultrasound-guided inplane transverse approach. Levobupivacaine 2,5 mg/ml, 0,5-0,7 ml/kg, were injected at the T5 level with direct ultrasound visu-

Results and Discussion: 30 neonates undergoing OA surgery were included, 25 patients (11 IV and 14 sPVB) had complete data for the perioperative period and 26 patients (13 IV and 13 sPVB) for the postoperative period.

Significantly lower consumption of fentanyl perioperative was found in the sPVB group compared to the IV-group [median] (range) 4,65 mg/kg (1,49 - 9,62) vs. 8,59 mg/kg (4,38 - 13,50) p=0,0005]. There was a trend towards shorter time on mechanical ventilation postoperatively in the sPVB group, however not significant [median (range) 21,3 hours (18,6 - 43,8) vs. 26,4 hours (19,0 - 68,0) p=0,099].

No complications due to the sPVB or the administration of the local anaesthetic was detected. There was no significant difference in length of PICU stay or need for pain treatment after PICU

Conclusion(s): sPVB is an effective and safe method for neonates undergoing primary repair of OA. sPVB significantly reduced perioperative fentanyl consumption, but postoperative mechanical ventilation was not significantly shortened. sPVB could be a valuable help to reduce surgical stress and the need of general anesthetics in this vulnerable group of patients.

22AP04-9

The influence of depth of anaesthesia on motor evoked potentials monitoring during scoliosis surgery in children and adolescents (SCOL study): a prospective observational study

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Background and Goal of Study: Intraoperative neurophysiological monitoring (IONM) is frequently used in high-risk spinal surgeries. The Scoliosis Research Society recommends IONM application during scoliosis surgery, specifically motor-evoked potentials (MEP) and somatosensory-evoked potentials (SEP) directed by neurophysiologists (1).

However, the lack of neurophysiologists leads to the alternative, which is only MEP monitoring directed by surgeons. Anaesthesia can affect MEP reproducibility and potentially MEP interpretation. This study aims to evaluate the influence of total intravenous anaesthesia (TIVA) depth on transcranial MEP reproducibility and interpretation by surgeons.

Materials and Methods: In this prospective observational study, we aimed to enrol 150 children and adolescent patients indicated for elective scoliosis surgery with surgeon-directed MEP monitoring under TIVA. We maintained TIVA respecting local protocol for scoliosis anaesthesia and titrated TIVA to the bispectral index (BIS) level 60 ± 5 after the pronation when MEP were monitored. We deepened the anaesthesia to the BIS level of 40 ± 5 before the skin incision and repeated MEP measurement respecting local protocol (2).

Results and Discussion: We enrolled all patients from September 2020 to August 2024. The initial MEP latencies and amplitudes on BIS level 60 ± 5 were baselines, resp. 100 %. The MEP parameters at the BIS level of 40 ± 5 were proportionally compared with the baseline. The MEP latencies were 103 % (97-110), median (minimum-maximum), and the MEP amplitudes were 78 % (40-118) at the BIS level of 40 ± 5 .

Although MEP parameter changes at the BIS level of 40 ± 5 were statistically significant, the interpretations by surgeons were not altered and not clinically significant.

Conclusion(s): Our study data shows statistically significant differences in latency and amplitude in dependence on the TIVA depth. However, these changes are not clinically significant for interpretation by surgeons in MEP if TIVA depth is maintained in the recommended BIS range of 40-60.

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22AP04-10

Evaluating the efficacy of clonidine premedication in reducing emergence delirium in children: a retrospective analysis

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Background and Goal of Study: Emergence delirium (ED) is a common and distressing postoperative complication in children, characterized by agitation and disorientation, with potential implications for recovery, safety, and postoperative behavior. Evidence suggests that preoperative anxiety increases the risk of ED. Clonidine, an alpha-2 adrenergic receptor agonist with sedative and analgesic properties, has shown potential for reducing ED incidence. Therefore, we aimed to evaluate the impact of clonidine premedication on ED in pediatric patients undergoing general anesthesia.

Materials and Methods: This retrospective cohort study analyzed data from 36 clinical studies involving 11,450 pediatric patients aged 0-16 years from Perth Children's Hospital, Australia. Propensity score matching was used to adjust for baseline covariates including age, sex, surgery type, and anesthetic maintenance method. Emergence delirium was assessed using validated scales including PAED, Watcha, and CAPD[ALdBG1] [DE2] . The outcome for patients receiving clonidine premedication was compared to those who did not.

Results and Discussion: Of the 4,742 children with available ED data, 7.2% (n=341) experienced emergence delirium, including 36 (10.6%) who had received clonidine. Oral clonidine premedication was administered to a total of 330 children. Following propensity score matching, we found a slightly higher incidence of ED in patients who received clonidine premedication (11%) compared to 9% in the matched non-clonidine group, consistent with the unmatched rates of 11% and 6.9% respectively. However, this difference was not statistically significant (OR 1.23, 95% CI 0.74-2.05, p=0.436). These findings suggest that clonidine may not be effective for mitigating ED when used as a premedication.

Conclusion(s): Clonidine premedication was not significantly associated with a reduced incidence of emergence delirium in pediatric patients in this retrospective analysis with propensity matching. However, compared to other common premedications such as midazolam, its potential benefits in analgesic sparing and postoperative recovery warrant further investigation in targeted populations. These findings can contribute to preoperative management strategies in pediatric anesthesia.

22AP04-11

Investigating the association between clonidine premedication and the risk of perioperative respiratory adverse events in children: A retrospective cohort study

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Background and Goal of Study: Perioperative respiratory adverse events (PRAE) are the major cause of critical incidents in pediatric anesthesia. They can lead to long-term neurological damage or even death. Sedative premedications such as clonidine are frequently used preoperatively for treatment of preoperative anxiety and as an analgesia adjunct. We aimed to investigate the association between clonidine premedication and the risk of PRAE in pediatric patients.

Materials and Methods: We conducted a retrospective propensity-score matched analysis by combining data from 36 clinical studies, encompassing 11,450 surgeries in pediatric patients aged 0-16 years at Perth Children's Hospital (and its predecessor, Princess Margaret Hospital), Australia. Propensity scores for the probability of treatment with clonidine were estimated using administrative (year of surgery, trial), patient-related (age, sex, weight, ASA, respiratory sensitivity), and surgical factors (induction type, maintenance type, airway device, and surgical specialty). Surgeries were matched 1:1 for clonidine and no-clonidine groups. The overall incidence of PRAE and the incidence of postoperative PRAE i.e., occurring at emergence from anesthesia or in the post-anesthetic care unit (PACU), were compared between matched groups.

Results and Discussion: 8,629 surgeries with full data sets were available for analysis, of which 7.7% have received clonidine as a premedication. The 1:1 matched dataset contained 1,324 surgeries (662 in each treatment group). Clonidine premedication was not associated with a statistically significant difference in overall PRAE incidence (18.3% in the clonidine group vs. 17.7% in the noclonidine group; OR 1.04 95% CI 0.79-1.38, p=0.775). Similarly, no statistically significant difference was observed for postoperative PRAE (11.2% vs. 10.6% in clonidine and no-clonidine groups respectively; OR 1.07 95% CI 0.75-1.51, p=0.722). Our results suggest that clonidine premedication does not significantly alter the risk of PRAE in pediatric patients.

Conclusion(s): Clonidine premedication was not significantly associated with the incidence of perioperative respiratory adverse events, either overall or during the immediate postoperative period. These findings from our retrospective propensity scorematched analysis contribute to evidence supporting the safety profile of clonidine, suggesting that it does not increase the risk of PRAE in pediatric patients.

22AP04-12

Non-operating room anesthesia for pediatric cardiac catheterization, including newborns: a comprehensive ten-year analysis of 665 cases at a single institution

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Background and Goal of Study: Pediatric cardiac catheterization and angiography are essential for diagnosing and treating congenital heart diseases. Anesthesia management is challenging due to variations in childeren age and medical conditions.1

This study presents demographic data, procedures, anesthesia management, and complications in pediatric patients who underwent diagnostic or therapeutic catheterization between 2014 and 2024 at Dokuz Eylul University, Department of Anesthesiology.

Materials and Methods: 665 pediatric patients who underwent procedures with NORA between 2014 and 2024 and had accessible data were included in this retrospective study.

First results of this research are here.

Results and Discussion: Initial results were evaluated. Patients' ages ranged from 1 day to 18 years. Of the 665 patients, 13 were newborn,147 were infant. Weights ranged from 1700 g to 107 kg. The gender distribution was equal (330 girls/ 335 boys). ASA classification:658 patients ASA 2-4 and total 7 patients ASA 1 and 5E.18 patients (2.7%) received general anesthesia and 647 patients (97.3%) received sedation. Among 13 newborn, 12 received general anesthesia (GA):147 babies aged 1-12 months received GA and sedation (n:8/n:139).

Sedative drugs included midazolam (0.03-0.1 mg/kg), ketamine(1–2 mg/kg), propofol(0.5–1 mg/kg), fentanyl(0.5–1 mcg/kg) and dexmedetomidine (0.5 mcg/kg). 2 patients had sedation converted to general anesthesia. Youngest patient receiving sedation was a 25-day-old newborn undergoing diagnostic angiography for ASD. All babies under 1 year were monitored postoperatively in the pediatric ICU or ward, regardless of anesthesia type. 13 patients (1.95%) had complications. Procedural complications included failed arterial puncture(3), arrhythmia(1), hypotension(1), hypoxic spell(1), need for IABP(1), and perioperative arrest(2).

Anesthesia-related complications included desaturation(2), nausea and vomiting(1), and local allergic reaction(1). Only one baby

Conclusion(s): Our study differs the literature by using sedation in 97.3% of cases included newborns, covering a wider age range and patient weights. Despite the risks, the low complication rate is likely due to continuous hemodynamic monitoring. The choice between general anesthesia and sedation should consider the pediatric patient's cardiac pathology, hemodynamic-pulmonary status and appropriate drug selection. Sedation at pediatric cardiac procedures seems safe.

Reference:

Curr Opin Anesthesiol. 2021;34:437-42.

22AP05-1

literature review of peri-operative preparation and premedication in children with autism spectrum disorder (ASD)

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Aim: To synthesise existing evidence about perioperative practices for the management of children and young adults with Autism Spectrum Disorder (ASD).

Method: A literature review was carried out of studies published in peer review journals of the current best practices and interventions in children and young adults with ASD undergoing medical procedures.

Results: Fifty-one studies and 17 review articles published between 1997 and 2018 were identified. Emerging priorities were an emphasis on increased attention to individual patient needs. preparation using psychological principles and social stories, engaging parents as experts in the care and having a consistent care giver in the hospital. Flexibility in the hospital setting was identified as advantageous and some innovative practices, for example to getting a service dog to give propofol were reported. The retrospective studies of premedication found a pattern of atypical use with frequent intramuscular or intranasal administration of ketamine. In day case procedures, excellent results were recorded with the use of alpha-2 agonists such as clonidine and dexmedetomidine as the sedative agent in both prospective and retrospective studies.

Conclusion: This review supports the need for better preparation using principles of cognitive behavioural therapy, social stories with individualised reward as motivator and desensitisation using toy/fake cannulation kits. Most of these are low cost strategies that can prevent harm and higher health care costs. We suggest they should be implemented and evaluated in all settings providing procedural care to children and young people with ASD. Having a staff member responsible for the patient and successful implementation of care plan has been successful and effective. Premedication: use of alpha2 agonist has been successful and should be further investigated in randomised trials.

22AP05-3

Dynamic of EEG signatures in children before, under and after general anaesthesia

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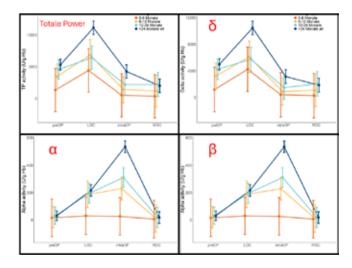
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Background: The benefits of electroencephalographic (EEG) neuromonitoring during anaesthesia in young children remain largely unexplored. Most EEG devices are designed and validated primarily for adults, leaving a gap in understanding their application for young, pre-school children.

However, young children are particularly susceptible to the effects of anaesthesia, and the impact of anaesthetics on brain development in this age group is still unclear.

This study aims to characterize perioperative frontal EEG signatures in preschool children.

Methods: This prospective observational clinical study recorded electroencephalogram (EEG) data from children (NCT02481999), with ethical approval from the Charité - University Medicine Berlin ethics committee (EA2/027/15).A total of 147 frontal EEG recordings from children aged 1 month to 8 years were recorded under general anaesthesia. EEG data was acquired using the Narcotrend Monitor, and the raw EEG files were subsequently analyzed across different frequency bands. The patients were grouped into four age categories (0-5 months, 6-11 months, 12-23 months, and over 24 months) to compare EEG signatures between these age groups.



Results: Delta activity is present across all age groups prior to the induction of anaesthesia. With loss of consciousness, Delta activity increases in all groups, with a more marked increase in older children. Intraoperatively, Alpha activity begins to appear in children aged six months and older, whereas infants (0-5 months) display no Alpha or Beta frequency activity during anaesthesia, maintaining a high level of Delta activity. As consciousness returns, faster frequencies gradually diminish, leaving Delta activity as the predominant rhythm in all age groups.

Conclusion: In conclusion, this study characterizes perioperative EEG signatures in children aged 1 month to 8 years from induction to emergence phases of general anaesthesia. The findings reveal distinct differences in EEG signatures across age groups, highlighting the need for age-adapted monitoring systems to safeguard this vulnerable population from the risks of over- and under-sedation.

22AP05-4

Ventricular tachycardia refractory to cardioversion in a pediatric patient without congenital cardiac anomaly: case report

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Background: Ventricular tachycardia (VT) in a pediatric patient without congenital cardiac anomaly is a rare entity and althought generally associated with a good prognosis, it can sometimes cause serious complications.

Case Report: We report a case of a 3-years-old girl who presented to our emergency department following a flu-like illness with palpitations.

On examination the child was found to be normotensive with irregular pulse. The EKG showed a polymorphic wide QRS tachycardia at a rate of 240-280 bpm. Immediately adenosine was given as a safe diagnostic and therapeutic agent.

There was no response and a diagnosis of a ventricular tachycardia was made and initially intravenous amiodarone was tried and synchronized cardioversion was planned. Sinus rhythm was not restored following three repeated attempts at synchronized cardioversion and bolus dose of amiodarone 5mg/kg.

The child was then put on amiodarone infusion and intravenous xylocaine 1.5mg/kg was given as a last resort to convert to sinus rhythm. When the heart rate began to slow as a response to this therapy we deside to continue with a xylocaine infusion until desired effect.

After 2 hours sinus rhythm was restored and the xylocaine infusion was discontinued. No recurrences of VT were seen in one month and six months follow-up time, with several isolated premature ventricular contractions on Holter exam.

Discussion: VT is a rarity that can cause sudden death in children with an otherwise normal heart and it is of utmost importance to detect and treat these children.

It can occur in children with cardiomyopathy, following some heart surgeries, and with inherited diseases that affect the heart's electrical system (e.g. Long QT syndrome, Brugada's syndrome), also metabolic or electrolyte abnormalities and medication toxicity. In the case of our patient on futher investigation Human coronavirus OC43 infection was detected with molecular PCR testing and the patient was discharged with oral beta blocker for rhythm control.

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- 2. Roggen A, Pavlovic M, Pfammatter JP. Frequency of spontaneous ventricular tachycardia in a pediatric population. Am J Cardiol. 2008;101(6):852-854. doi: 10.1016/j. amjcard.2007.10.047.

22AP05-5

Hydromorphone reduced the incidence of emergence agitation after adenotonsillectomy in children with obstructive sleep apnea: a randomized, double-blind study

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Background and Goal of Study: Emergence agitation (EA) after (adeno)tonsillectomy (AT) surgery impairs the quality of recovery in children. Adequate analgesia plays a crucial role in reducing the incidence of EA. This study validated that anesthesia induction with hydromorphone infusion could reduce the incidence of EA following AT surgery for obstructive sleep apnea (OSA) in children.

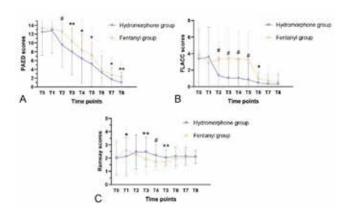
Materials and Methods: 183 ASA physical status I to III children aged 3 to 7 years undergoing AT surgery were enrolled in a blinded randomized controlled trial of hydromorphone (30 µg/kg) versus fentanyl (4 µg/kg) infusion during anesthesia induction.

The primary outcome was the incidence of EA within 30 minutes after extubation.

Secondary outcomes included the pediatric anesthesia emergence delirium (PAED) scores, the face, legs, activity, crying, consolability (FLACC) scores, Ramsay sedation scores, extubation time, duration of post-anesthesia care unit stay, the incidence of rescue analgesia, and perioperative adverse events.

Results and Discussion: Compared with the fentanyl group, the incidence of EA within 30 min after extubation in the hydromorphone group was significantly lower [48.4% (45/93) vs. 64.5% (60/93); absolute difference, 16.1%; 95% confidence interval, 18.9% to 29.5%; P=0.027], with decreased PAED, FLACC and Ramsay scores in post-anesthesia care unit. In subgroup postanalysis by age, the difference in incidence of EA between hydromorphone and fentanyl was only observed in children aged 3-5 years old (51.7% vs. 77.6%, P = 0.006).

However, this difference became insignificant in elder children aged 6-7 years old (42.9% vs. 50.0%, P = 0.527). The proportion of patients with postoperative moderate-to-severe pain (FLACC scores > 3 at any time point) was significantly lower in the hydromorphone group than in the fentanyl group (57.0% vs.77.4%, χ^2 = 8.806, P = 0.003). Neither of the two groups experienced postoperative complications.



Conclusion(s): Hydromorphone at 30 µg/kg effectively reduces the incidence of EA within 30 minutes post-extubation in children after AT surgery, providing superior analgesia and a high safety profile compared to fentanyl.

22AP05-6

Optimal electrode positions for electromyographic neuromuscular monitoring by posterior tibial nerve stimulation in infants

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Background and Goal of Study: Monitoring neuromuscular blockade (NMB) is strongly recommended when muscle relaxant is used in general anaesthesia. In infants or small children, NMB monitoring at the adductor pollicis muscle is occasionally unavailable due to the interference by vascular lines. Therefore, the sole is a potential monitoring site in these patients. In monitoring NMB by electromyographic (EMG) technology, reliable EMG signals must be obtained.

In this study, we have placed multiple electrodes on the sole and measured evoked EMG signals to investigate the optimal electrode positions

Materials and Methods: After IRB and parental consent, fifteen infants without neuromuscular disease were enrolled. Anaesthesia was maintained with sevoflurane or propofol and remifentanil. Rocuronium was administered before the intratracheal intubation. After the end of surgery and the confirmation of train-of-four ratio > 0.9 at the adductor pollicis muscle, eight surface electrodes were placed on the sole (Figure).

Supramaximal stimulation was applied on the posterior tibial nerve at the ankle, and the EMG amplitudes from eight electrodes against the ground electrode (placed at the base of the great toe, G in Figure) were recorded simultaneously. Amplitudes were compared between electrodes using one-way ANOVA or Student's t test as appropriate. A p value < 0.05 was considered

Results and Discussion: The age and weight of the patients were 6.5±3.8 months and 7.3±1.7kg, respectively. The intensity of supramaximal nerve stimulation was 57.5±11.4mA. EMG amplitudes from eight electrodes were shown in Table. The amplitude was higher at the heel-side (A3, A4, A7, and A8) than at the toe-side (A1, A2, A5, and A6). There was no statistical difference between medial (A3, A4) and lateral (A7, A8) electrodes.

Electrode	A1	A2	А3	A4	A5	A6	Α7	A8
Amplitude(mV)	0.8	11.2	16.5	15.4	5.0	12.6	15.3	15.6
Ampillude(mv)	±0.6	±3.1	±3.2	±3.1	±1.8	±2.8	±2.4	±3.1

Table. Evoked EMG amplitudes at each electrode

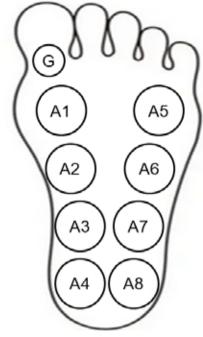


Figure. Positions of electrodes.

Conclusions: Sufficient amplitudes for NMB monitoring were obtained at sole electrodes by posterior tibial nerve stimulation. The heel of the sole can be a preferable position for NMB monitoring by EMG in infants.

22AP05-7

A rare case of pediatric temporomandibular joint ossifying myositis: customized airway strategies

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Background: Ossifving myositis (OM) is a rare condition involving heterotopic bone formation, often post-trauma. OM in the temporomandibular joint (TMJ) is particularly rare in pediatric patients, with fewer than 1% of cases under 10 years old. TMJ OM can severely limit mouth opening, creating a difficult airway. This case highlights the challenges of managing airway and anaesthesia in paediatric OM with severe restrictions.

Case Report: An 8-year-old boy presented for coronoidectomy and pterygoidectomy due to progressive TMJ OM, with a mouth opening of <1 cm. This condition followed facial trauma at 18 months and required two previous surgeries for TMJ ankylosis, with recurrence after each.

Given the severe restriction, a difficult airway was anticipated. The patient was uncooperative with awake procedures, so fiberoptic nasotracheal intubation under general anesthesia with spontaneous ventilation was planned. Preparation included nasal topicalization with lidocaine and vasoconstrictor, IV induction agents, and the presence of a paediatric ENT specialist. A custom-modified nasotracheal tube was prepared by connecting two 5.5-sized tubes to ensure proper length and diameter.

Following sevoflurane induction and IV cannulation, sedation with ketamine and fentanyl maintained spontaneous ventilation, ensuring patient tolerance to the procedure. The tube was successfully placed under fiberoptic guidance, and the surgery proceeded without complications.

Discussion: This case illustrates the challenges of managing paediatric TMJ OM with severe airway restrictions. Tailored equipment and preoperative topicalization combined with IV induction agents enabled spontaneous ventilation and a safe fiberoptic intubation while ensuring correct sedation and tolerance to the procedure. OM's rarity highlights the importance of individualized strategies in such cases.

References:

- 1. Echeverry Marín, P. C., & Engelhardt, T. (2014). Algorithm for managing pediatric difficult airways. Colombian Journal of Anesthesiology, 42(4), 325-334.
- 2. Simmonds, J., et al. (2016). Pediatric nontraumatic myositis ossificans. Int J Pediatr Otorhinolaryngol, 84, 116-118.

Learning Points:

- 1. TMJ OM in paediatric patients presents unique and complex airway challenges.
- 2. Customizing airway material and planning is crucial for managing specific difficult airway situations.
- 3. Effective topicalization and sedation ensure safe fiberoptic intubation with spontaneous ventilation in paediatric patients.

22AP05-8

Successful airway management in a pediatric patient with a large melanotic neuroectodermal tumor of infancy affected with his oral cavity stenosis

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Background: Melanotic neuroectodermal tumor of infancy (MNTI) is a rare tumor arising from the neural crest cells. It occurs mainly in the maxilla of the infants and grows rapidly [1].

Although it is challenging to secure the airway in a patient with a tumor-occupied oral cavity, we achieved successful airway management in an infant with a large MNTI in his mouth.

Case Report: A 6-month-old boy presented with his right-sided upper jaw swelling. The swelling rapidly grew to a large mass which occupied more than half of his oral cavity, and the surgical resection was scheduled. He was able to suck milk until the surgery. He suffered from bleeding of the tumor and needed astriction frequently in the preoperative period. At the preoperative visit, there was space in his oral cavity for manipulation when he bent backward. We used low-dose remimazolam and sevoflurane as induction agents. After we confirmed facemask ventilation under deep sedation, we used rocuronium and performed the oral intubation with the use of the Pentax Airway Scope® from the left side of his mouth.

Discussion: The tumor bled several times before the surgery. and therefore we planned a nasal intubation at first so that we avoid the tumor. Once a tumor bleeds, it is difficult to use a video laryngoscope and/or fiber scope. However, oral intubation was better for the surgeons to perform surgery, and we decided it. We considered facemask ventilation through the nasal cavity would be possible because he could suck milk. Hence, we decided to intubate after we used anesthetic drugs. Also, we administered remimazolam which can be reversed in case of facemask ventilation failure. Dose of remimazolam increased step by step. After adequate depth of anesthesia with additional sevoflurane inhalation, we checked the patency of the airway again and administered rocuronium.



References:

1. Rachidi Saleh et al. Melanotic Neuroectodermal Tumor of Infancy: A Systematic Review. Journal of Oral and Maxillofacial Surgery, 2015:73:1946-56.

Learning Points: This case showed that it is essential to perform an airway risk assessment and have a preformulated strategy for the management of the tumor-occupied oral cavity.

22AP05-9

Difficult airway management in an infant with severe lingual tonsillar hypertrophy

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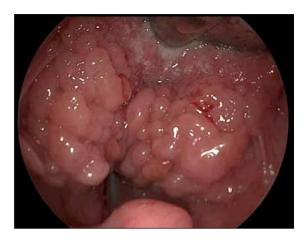
Madrid, Spain

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Background: Lingual tonsillar hypertrophy (LTH) is a known cause of OSA and paediatric airway obstruction. It can cause varying degrees of airway obstruction and should be considered a potential difficult airway. Severity is determined by the extent to which the lingual tonsil occupies the vallecula and classified by 4 degrees(1).

Case Report: We describe the case of a 9-year-old girl with OSA, nasal speech and dysphagia. Adenotonsillectomy was performed at 3 years old. She has currently been diagnosed with LTH Grade 4 and is scheduled for lingual tonsillectomy surgery. Given the risk of difficulty with both ventilation and tracheal intubation, intubation with a nasal fiberoptic bronchoscope was performed under spontaneous ventilation. Both nostrils were prepared with tetracaine + adrenaline-soaked lentils and 4 ml of nebulized 2% lidocaine were administered. Inhalation induction was performed

with 6% sevoflurane, and once adequate hypnosis was achieved, nasal intubation was performed with a fiberoptic bronchoscopy, with a No. 5 tube. Then, lingual tonsillectomy was carried out. Admission to the ICU intubated for 72 hrs was required to control oedema and bleeding, and maintaining treatment with systemic corticosteroids, successful extubation was achieved.



Discussion: Making the diagnosis of LTH in children with OSA is important, as it can modify anaesthetic approach to a potential unplanned difficult airway management as well as the postoperative care planning in the ICU, which may require up to 4 days of endotracheal intubation due to the risk of oedema and bleeding. including preventive tracheostomy(2).

References:

- 1. Kang KT, et al. Lingual Tonsillectomy for Treatment of Pediatric Obstructive Sleep Apnea: A Meta-analysis. JAMA. 2017.
- 2. Sarmento J, et al. Fiberoptic intubation in a child with previous unexpected difficult airway due to lingual tonsil hypertrophy. Rev Esp Anestesiol Reanim. 2019.

Learning Points: Patient safety is the maximum priority in any medical situation, especially when dealing with a potential difficult airway. These patients must be considered as having a difficult extubation and it's necessary to have a difficult extubation plan.

22AP05-11

The development of a comprehensive pediatric enhanced recovery after surgery (ERAS) program utilizing a pathway development team

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Background: While ERAS pathways are gaining momentum in the pediatric realm, the development, implementation, and maintenance of these pathways can be a time-intensive process that may deter physicians from undertaking the effort.

Fortunately, the Department of Evidence Based Practice (EBP) at our pediatric hospital plays a pivotal role in streamlining and expediting the ERAS pathway development and implementation process.

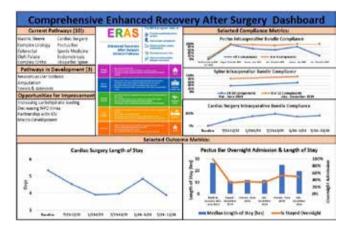
Methods: In a quality improvement collaboration with our hospital's EBP team starting, a total of ten ERAS pathways have been implemented. Each pathway is championed by an anesthesiologist and surgeon in partnership with nursing teams. Current services include cardiac surgery, pediatric surgery, urology, gynecology, orthopedics, sports medicine, and spine surgery.

The development, implementation, and monitoring of the ERAS pathways are coordinated by the EBP team, with all ERAS pathways made accessible externally on the hospital's website. Monthly reports of compliance and outcome measures monitor the success of the pathways.

Results: A comprehensive dashboard was created to help capture the entire program, including our most updated handout to patients. (Image 1).

The dashboard reveals the following intraoperative bundle compliance rates: pectus bar insertion currently achieves 100% compliance for 8 of 9 components and 25% compliance for all 9 components; spine surgery achieves 82% compliance for 9 of 10 components and 38% compliance for all 10 components; and cardiac surgery demonstrates 84% compliance across all components.

This dashboard currently shows a decreased need for overnight admission in the pectus bar pathway (50% vs 100% at baseline) and a decreased length of stay in the cardiac surgery pathway (3.9 days vs 5.3 days at baseline).



Conclusion: Working alongside a dedicated pathway team, ten pediatric ERAS pathways have been successfully implemented and have been associated with certain improved outcome metrics.

This collaborative approach has fostered teamwork across disciplines and reduced the burden on physicians, resulting in a stronger and more effective ERAS program that continues to expand.

22AP05-12

Intraoperative dexmedetomidine and acute kidney injury in paediatric non-cardiac surgery: a retrospective propensity score-matched analysis

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Background and Goal of Study: Paediatric acute kidney injury (AKI) is common and linked to longer hospitalization and mortality. We investigated whether a continuous intraoperative infusion of dexmedetomidine, which increases renal blood flow, was associated with a lower risk of postoperative AKI in paediatric patients undergoing non-cardiac surgery.

Materials and Methods: This retrospective cohort study included paediatric patients undergoing non-cardiac surgery between January 2019 and July 2021. Propensity score matching (PSM), based on the participants' baseline characteristics, was used to minimize the potential bias.

The primary outcome was AKI within 7 days after surgery. The secondary outcomes included intensive care unit (ICU) admission, in-hospital mortality, length of hospitalization, intraoperative bradycardia and hypotension. The exposure of interest was continuous intraoperative infusion of dexmedetomidine at any dosage or duration.

Multivariable logistic regression and linear regression analyses were further employed to adjust for residual imbalanced intraoperative factors in the matched cohort.

Results and Discussion: After propensity score matching, we identified 1858/4091 paediatric patients who had received intraoperative dexmedetomidine infusion. Intraoperative dexmedetomidine infusion was associated with a lower risk of AKI (1.4% vs 3.2%; odds ratio (OR) 0.43; 95% confidence interval (CI) 0.27-0.66: P<0.001), postoperative ICU admission (OR 0.35 95% Cl: 0.3-0.42; P<0.001), and shorter hospitalization (7 vs 9 days; P<0.001). Intraoperative bradycardia, hypotension, and in-hospital mortality were similar between the matched groups.

Conclusion(s): This retrospective analysis of a single-centre paediatric non-cardiac surgery cohort suggests that intraoperative dexmedetomidine infusion was associated with a lower incidence of AKI within 7 days postoperatively.

22AP06-1

The risk of postoperative nausea and vomiting (PONV) in pediatric patients under dental and oral surgery

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Background and Goal of Study: Postoperative nausea and vomiting (PONV) is a relatively common complication of general anesthesia. We encountered PONV in pediatric patients after dental and oral maxillofacial surgeries under general anesthesia. In particular, there is a higher incidence of PONV due to bleeding of the oral cavity and aspiration of gastric contents. In addition, it might be difficult for pediatric patients to communicate the intensity and characteristics of their symptoms. However, the few studies have focused on dental and oral maxillofacial surgeries. In this study. we retrospectively investigated the risk factors of PONV on the first postoperative day in pediatric patients.

Materials and Methods: The anesthesia records of patients (aged 0-12 years) were retrospectively reviewed. The patient underwent dental and oral maxillofacial surgeries. The patients' background (gender, age, BMI), anesthesia time, use of anesthetic drugs, nitrous oxide (N_oO), history of PONV, motion sickness, disability, and time to oral intake were investigated. In the univariate analysis, Fisher's exact and χ 2 tests were used, and a multivariable analysis was performed using stepwise logistic regression to determine the risk factors of PONV.

Results and Discussion: A total of 589 patients were enrolled, with a mean age of 5.6 ± 2.8 years, and were divided in two groups based on the presence or absence of PONV. Eighty-six patients (17.0%) complained of PONV. The occurrence of PONV was correlated with age, BMI, anesthesia time, fentanyl, N2O, history of PONV, and motion sickness. Fentanyl was the highest risk factor (odds ratio=1.76; 95% confidence interval=1.33-2.32). Other risk factors included motion sickness, age, duration of anesthesia, BMI, history of PONV, and N₂O.

In many cases of minor surgeries in the oral region, drugs such as acetaminophen can be substituted for opioids. In addition, the use of a gastric tube may have resulted in a lower incidence of PONV compared to previous reports. We thought that PONV can be reduced by changing some aspects of anesthetic management.

Conclusion(s): The highest risk of PONV (17.0%) was determined to be dose of fentanyl for pediatric patients who underwent dental and oral maxillofacial surgeries under general anesthesia.

22AP06-2

Vitamin D attenuates neurotoxicity induced by propofol in offspring mice

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Background and Goal of Study: Propofol is an intravenous agent widely used for the induction and maintenance of anaesthesia. It readily crosses into the placenta and brain and can induce neurotoxicity. Vitamin D, a neuroprotective hormone, inhibits neuroinflammatory and apoptotic processes in the brain and contributes to neurotrophin expression and myelination. We investigated whether vit D could attenuate sevoflurane-induced neurotoxicity in the offspring of mice.

Materials and Methods: Twenty 8-week-old pregnant Swiss albino mice were divided into 4 groups of 5 mice each: Control(group C), vit D (group D), propofol (group P), and propofol with vit D (group PD). Throughout pregnancy, groups D and PD received 5 mcg/kg/day of vit D, while groups P and K received 1 ml of saline. On day 14 of pregnancy, groups P and PD received 200 mg/ kg propofol. Newborn mice from these groups were used in this

Twelve offspring from each group were examined by electron microscopy (EM) and immunohistochemical methods to assess the expression of IL6, BDNF, TNF-alpha, c-Fos, Bcl-2, Bax ,Olig2 in prefrontal cortex and hippocampal tissue sections. Behavioural tests, including the open field and elevated plus maze tests, were performed on day 45.

Results and Discussion: Vit D significantly attenuated the propofol-induced increase in the expression levels of inflammatory cytokines (Figure 1, IL-6, TNF- α ; p < 0.0001) and apoptotic factors (Figure 1,2, Bax, c-Fos; p < 0.0001). Vit D also improved the expression levels of anti-apoptotic factors (Figure 1, Bcl 2; p < 0.0001) and neuroprotective proteins (BDNF, Olig2; p < 0.0001). EM images supported these data.

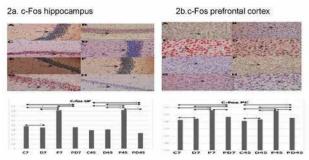


Figure 2. Immunohistochemical reactivity and scoring of c-Fos

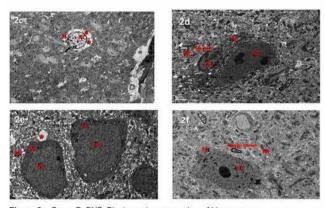
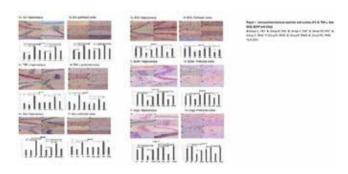


Figure 2c. Group P, PN7, Electron microscopy view of hippocampus Figure 2d. Group PD, PN7, Electron microscopy view of hippocampus Figure 2e. Group P, PN45, Electron microscopy view of hippocampus Figure 2f. Group PD, PN45, Electron microscopy view of hippocampus M: Mitochondria, N: Neuron, NC: Nucleus



Conclusion(s): Our results suggest that neuroinflammation and neurotoxicity induced by maternal propofol exposure on day 14 of gestation can be attenuated by maternal vit D teratment.

22AP06-3

EEG pattern during sevoflurane vs dexmedetomdine-remifentanil low dose sevoflurane based anesthesia in children up to the age of 5 years

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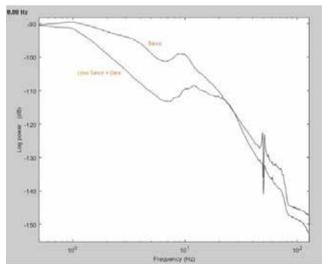
Background and Goal of the Study: Current brain activity monitoring predominantly relies on EEG-derived indices or single-number parameters. However, these indices often diverge from clinical assessments of unconsciousness, as they inadequately reflect the neurophysiological effects of anesthetic drugs.

The aim of this prospective cohort study is to investigate electroencephalographic (EEG) activity, including both periodic and aperiodic components, in children undergoing two different anesthetic regimens: low-dose sevoflurane combined with dexmedetomidine and remifentanil vs standard-dose sevoflurane with remifentanil.

Materials and Methods: During one-year inclusion period, we collected data from 28 pediatric patients. After induction, EEG was recorded continuously, focusing the analysis on spectral power, spatial distribution, and aperiodic components (spectral exponent). Data about BIS (BIspectral Index) and EtSevo (End-Tidal Sevoflurane) were also collected, every five minutes.

Result and Discussion: The low-dose sevoflurane group exhibited oscillatory activity extending to higher frequencies compared to the standard-dose group. The standard-dose group demonstrated greater absolute power in the delta and alpha bands. Delta power predominated in posterior regions in both groups, consistent with the developmental pattern of cortical maturation from posterior to anterior regions in children. The SE was more negative in the standard-dose group, indicating greater neuronal inhibition compared to the low-dose regimen: frontal (p < 0.002), central, and occipital (p < 0.001), respectively.

Spectral power distribution (PSD) analysis and the spectral exponent appear to be promising tools for monitoring the depth of anesthesia in pediatric patients, offering potential advantages over conventional indices like BIS.



Reference:

Purdon, P.L. 2015. Clinical Electroencephalography for Anesthesiologists, Anesthesiology 123, 937-960. Sarasso, S. Consciousness and Complexity during Unresponsiveness Induced by Propofol, Xenon, and Ketamine. Current Biology Volume 25, Issue 23, 7 December 2015, Pages 3099-3105.

22AP06-4

Airway management in children with severe scoliotic spinal deformity

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Background and Goal of Study: Patients undergoing surgery for severe scoliosis with a Cobb angle exceeding 70 degrees pose significant challenges for anesthesiologists, particularly regarding airway management and tracheal intubation.

This study aimed to determine the risk factors for difficult airways in paediatric patients with severe scoliosis based on spinal curvature severity.

Materials and Methods: This observational, prospective-retrospective study included 86 patients aged 7-18 years, operated for scoliosis with a Cobb angle >70° between 2017 and 2024 at JSC «Medicina», Moscow. Inclusion criteria were: age 7-18 years and planned corrective scoliosis surgery.

Patients were divided into two groups: Group 1 (n=34) with Cobb angle 70-120° and Group 2 (n=51) with Cobb angle >120°. Airways were assessed using the Mallampati classification and the LEMON score.

The frequency of direct laryngoscopy, videolaryngoscopy and bronchoscopy use was analyzed. Statistical analysis was conducted using the Mann-Whitney U test.

Results and Discussion: Mallampati score differed significantly between groups (p<0.05), with Group 1 having a median score of 1.788 ± 0.363 compared to 2.417 ± 0.292 in Group 2. LEMON scores were also higher in Group 2 (2.362 ± 0.422) than in Group 1 (1.394 ± 0.46) (p<0.05). Endoscopic visualization tools were reguired less frequently in Group 1 (6.25%) compared to Group 2 (25.49%) (p<0.05).

Patients with less severe scoliosis more often underwent successful intubation using direct laryngoscopy alone.

Conclusion(s): Patients with a higher Cobb angle have a significantly increased risk of difficult airways. Endoscopic visualization tools, such as videolaryngoscopes and bronchoscopes, are crucial for safe and effective tracheal intubation in this group. Future studies should explore strategies to optimize airway management in this challenging population.

22AP06-6

A fight against sevoflurane emergence delirium in children: does remimazolam use in children following tonsillectomy and adenoidectomy prolongate emergence time and length of PACU stay? A randomized controlled study

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Background and Goal of Study: A well-known postoperative behavior disorder after sevoflurane anesthesia in the pediatric population, characterized by screaming, kicking and restlessness is emergence delirium. Several interventions, which have been studied to prevent its occurrence, may result in delayed extubation and prolonged PACU stav.

Remimazolam is short-acting benzodiazepine, which used postoperatively, reduces emergence delirium after sevoflurane anesthesia in children following tonsillectomy and adenoidectomy. However, does its use prolongate emergence time and length of PACU stay?

Materials and Methods: One hundred and ten patients between the ages of 1 and 9, who were set to undergo tonsillectomy and adenoidectomy with sevoflurane anesthesia were enrolled.

Patients were randomly allocated to receive either remimazolam at a dosage of 0.1 mg/kg (intervention group, n=57) or 0.9% normal saline (control group, n=53) at the end of the procedure.

Chi square test was used to examine differences in Aldret score upon awakening between groups. The difference in the duration of anesthesia emergence between groups was tested by the Mann-Whitney U test.

Results and Discussion: 30/53 children in the control group had an Aldret score greater than or equal to 9, while in the remimazolam group 28/57 children had an Aldret score greater than or egual to 9. There was no statistically significant difference in the Aldret score upon emergence between group (P=0.552).

The average duration of emergence was 10 (9-13) minutes in the control group, while in the remimazolam group was 10 (9-12) minutes. Data are presented as median (interguartile range).

There was no statistically significant difference in the duration of the emergence between the groups (P=0.674).

Conclusion(s): Intravenous remimazolam, administered at the end of surgery, not only decreases incidence of emergence delirium, as shown in other studies, but it does so by not prolongating emergence time and PACU stay.

With these characteristics remimazolam emerges as a leading drug in a fight against emergence delirium after sevoflurane anesthesia

Reference:

Cai YH, Zhong JW, Ma HY, Szmuk P, Wang CY, Wang Z, Zhang XL, Dong LQ, Liu HC. Effect of Remimazolam on Emergence Delirium in Children Undergoing Laparoscopic Surgery: A Double-blinded Randomized Trial. Anesthesiology. 2024 Sep. 1;141(3):500-510. doi: 10.1097/ALN.000000000005077. PMID: 38758221; PMCID: PMC11323754.

22AP06-7

Challenges for anesthesiologists in patients with Proteus syndrome: case report

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Background: Proteus syndrome (PS) is a rare disorder (1 in 1000 000) which is characterized by postnatal overgrowth of various tissues including bones, skin and soft tissues, with about 200 cases of syndrome described in the literature. Syndrome is the result of mosaic mutation in the AKT1 gene. Life expectancy is between 9 months and 27 years depending on the severity of existing anomalies. Characteristic facial phenotype- macrocephaly, abnormal teeth and macroglossia, soft tissue owergrowth with assymetric tonsils and adenoids are commonly found and may be the risk factors for difficult intubation.

Case report: The first case of PS in Lithuania was diagnosed in 2021 for a 14 year old boy. Clinical symptoms of syndrome manifested in second year of life with significant disease progression in adolescence. During past 4 years our patient underwent 10 orthopedic surgeries under general/combined - general and regional anesthesia and diagnosis was confirmed only after genome sequencing testing of biological material was done. Our patient lost his leg due to vein thrombosis and spreading infection of affected limb.

All general anesthesias were uneventful. Despite facial phenotype airway management dificulties did not occur. Ultrasound guided regional anesthesia was performed with minor challeng-

Discussion: The specific symptoms and severity of PS varies a lot and leads to a challenging diagnosis. Although orthopedic manifestations of PS is not the main issue of the disease, it should be taken into account when treating this syndrome.

In case of multiple surgeries difficult airway management might be an issue. Complicated wound healing, blood loss and thrombosis of dilated veins in affected areas are common.

References:

Proteus syndrome: what the anesthetist should know -ScienceDirect

Anesthesia for proteus syndrome - Cekmen - 2004 - Pediatric Anesthesia - Wiley Online Library

ethi D. Proteus syndrome. Sethi Proteus Syndr. 2018 m. kovo;(3-2018):S85-92.

Learning points: A patient with PS may be challenging for the anesthesiologist. The characteristic facial phenotype can lead to difficulties in airway management. Vascular malformations increase both bleeding and thrombosis risk during surgery. Tissue malformations cause difficulties in performing regional anesthesia.

22AP06-8

Re-expansion pulmonary oedema during tube thoracotomy under conscious sedation in a paediatric patient with anterior mediastinal mass

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Background: We describe the successful management of a child with large anterior mediastinal mass who developed re-expansion pulmonary oedema during surgery of chest drain insertion, line insertion and lymph node biopsy under conscious sedation in our

Case report: A 14 years old male child weighing 43 kgs with large anterior mediastinal mass with pleural effusion and superior vena naval obstruction was planned to have chest drain insertion, tunnelled femoral line insertion and cervical lymph node biopsy under conscious sedation. He presented with a short history of 1 week with cough, shortness of breath and loss of weight. Radiological investigation showed large anterior mediastinal mass. He was admitted in ICU where 2 large bore peripheral IV lines and IA line were inserted in lower limbs.

The child was brought to OT in a slight head up position and monitoring lines were attached. He was sedated with Precedex and Ketamine infusions and positioned head up with supplementary

Local anaesthesia was infiltrated to the skin and a 24 Fr chest drain inserted with initial drainage of 700 mls hemoserous fluid. The chest tube was clamped and the surgeon proceeded with cervical lymph node biopsy. At this juncture, the patient became increasingly breathless and tachypneic with intermittent coughing. The oxygen requirement increased and patient was put on Pressure support of 8/5 cms of water but he remained hypoxic with saturation fluctuating between 85-91. Inj Frusemide 40 mg was given IV and IDC inserted.

A brief trial of BIPAP with pressures of 15/8 with 8L/min of oxygen did not improve the saturation and then it was planned to intubate the child. Chest drain was unclamped intermittently to drain a total of 2200 pls in 105 minutes.

The child was given boluses of IV Midazolam 10 mg and IV Ketamine 140 mg. The Blood pressure was supported with IV Adrenaline 0.2mcg/kg/min and the he was intubated with C-Mac Grade 1 view ETT 6.5 cuffed tube.

The child was the sent to ICU with stable hemodynamics.

Discussion: This child developed re-expansion pulmonary oedema following chest drain. It is a rare iatrogenic complication where chronically collapsed lung quickly re-expands following evacuation of air/fluid from pleural space. The incidence is around 1% and the mortality is as high as 20%.

Learning points: Early detection and planned management of this complication is necessary for good outcome.

22AP06-9

Role of mid-regional fragment of pro-adrenomedullin peptide (MR-proADM) in pediatric patients with severe infection: preliminary analysis of a monocentric prospective study

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Background and Goal of Study: The MR-proADM is a biomarker produced by endothelial cells showing a potential for early diagnosis, risk stratification, and prognosis prediction in critically ill patients with infections, including pediatric population.

Our study aimed to investigate its prognostic value and the correlation to severity scores and routine biomarkers in pediatric patients with severe respiratory infections (SRI).

Materials and Methods: We analyzed the retrospective data of patients admitted between December 2023 and June 2024 at the Pediatric Intensive Care Unit of a university hospital in Turin (Italy), for SRI. Among the inclusion criteria, the patients' age (28) davs - 16 years).

Exclusion criteria included pathologies correlated with augmented MR-proADM values according to literature, and hospitalacquired infections. MR-proADM levels were assessed within 24 hours from admission, on days 3 and 6, alongside other routine

Follow-up was conducted up to 60 days after discharge, Descriptive analysis and Spearman correlation analysis between MRproADM and the variables of interest were performed.

Results and Discussion: 20 patients were collected; the sample was homogeneous for sex but not for age (24 months old on average). All infections were respiratory, mainly viral bronchiolitis, with respiratory syncytial virus as the most frequent pathogen. Bacteria were found only in 3 cases, with one case of septic shock. Considering MR-proADM values, our population showed a mean value of 0.84 nmol/L (±0.23) at admission, lower than the comparison literature (cut-off 1.37 nmol/L). No patient died during the observation period and the length of stay in PICU and hospital had a median value of 4 and 18 days respectively.

The exploratory analysis showed a positive, statistically significant correlation between MR-proADM and procalcitonin and with some of the analyzed scores (pSOFA, PRISM III at 12h and 24h). No significant correlation was found with C-reactive protein, white blood count and other scores such as PIM 2 and PIM 3. Considering the ventilation-free days parameter as a primary outcome, the correlation with MR-proADM values was not statistically significant.

Conclusion(s): MR-proADM correlates with some routine biomarkers and scores, supporting its promising role as an early biomarker of severity.

studies are needed to deepen its diagnostic and prognostic role in pediatric patients with severe respiratory infections.

22AP06-10

Anxiolytic and analgetic effect of N₂O:O₂ 50%:50% gas mixture for vein puncture and arterial line placement in pediatric patients: A small prospective observational pilot study

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Background and Goal of Study: Nitrous oxide (NaO) can be efficiently and safely used in pediatric population for sedation in procedures of light to moderate pain intensity. The aim of the study is to observe the effect of N₂O:O₂ 50%:50% fixed gas mixture in children for vein and arterial line placement.

Materials and Methods: A single tertiary center prospective observational study. Ethic committee approval and parental/legal guardian informed consent obtained. Study was performed in accordance to Declaration of Helsinki. Inclusion criteria: age 1-16, planed peripheral vein and arterial.

Exclusion criteria: conditions with gas trapped in body cavity, otitis media, obstructive lung disease, upper airway infection, MTHF deficiency, megaloblastic anemia, bleomycin therapy, neuropathy. Dose of fixed N₂O:O₂ 50%:50% gas was equal to patient minute ventilation.

Outcomes: anxiolytic effect qualified as "cooperative" and "uncooperative", pain assessed using pain scales:1-4 years CHIPPS, 4-9 years FACES, > 9 years NRS, hypotension, bradycardia, desaturation. Pain was categorized as: 0-no pain, 1-3 mild, 4-6 moderate, 7-10 severe.

Results and Discussion: Results are presented in Tables 1 and 2. The majority of patients experienced and was cooperative. In 6 patients anxiety and separation fear were expressed, especially in children 4 years and younger. Pain was assessed as severe in 3 patients. It is possible that in these children emotional experience of pain, separation fear, younger age and cognitive disability were factors that influenced pain perception. Longer duration of application of gas mixture with parental presence might result in satisfactory pain and anxiety control.

	Mean ±sd, min, max / N° (%)
Age,y	4.69 ± 3.75 (1,14)
Gender (male)	17 (60.7)
Premedication (yes)	14 (50)
Time (min)	$6.00 \pm 3.17 (3,15)$

Table 1. Study population

Pain	Nº (%)	Anxiolysis	N° (%)	Complications	No (%)
No pain	6 (21.4)			Hypotension	0 (0)
Mild	11 (39.3)	Cooperative	22 (78.6)	Bradycardia	0 (0)
Moderate	8 (28.6)	Uncooperative	6 (21.4)	Desaturation	0 (0)
Severe	3 (10.7)				
Σ	28 (100)	Σ	28 (100)	Σ	28

Table 2. Outcomes

Conclusion(s): Application of N2O:O2 50%:50% gas mixture resulted in satisfactory pain control and anxiolysis. Further observation of large cohort is necessary.

22AP06-13 Status dystonicus: case report for monitored anaesthesia care

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Background: Status dystonicus (SD), often called dystonic storm or dystonic crisis, is a potentially fatal movement condition emergency (1). We performed monitored anaesthesia care for a paediatric patient with status dystonicus for examination of the eye to grade retinoblastoma. Anaesthetic agents itself can precipitate SD. Anaesthetic goal was to avoid any triggers of SD and to prevent the worsening of dystonia.

Case Report: 1.5 year old boy, weight 9kg with status dystonicus, West syndrome and bilateral intraocular retinoblastoma with left eye enucleated and post chemotherapy underwent examination of eye under sedation in our institution. Child had GDD and had underwent left eye enucleation under GA at 13 months of age which was uneventful. Child started having myoclonic seizures and abnormal posturing at 15 months of age and was diagnosed with West syndrome and status dystonicus. He was started on antiseizure medications and baclofen. He was sedated with inj. midazolam and inj. fentanyl.

On preoperative assessment, patient was sedated and had recurrent myotonic spasms despite being on multiple antiepileptics and muscle relaxants. Vitals and cardio-respiratory system examinations were within normal limits. IV access was 24g cannula on left foot.

Procedure planned was examination of right eye to assess status of retinoblastoma. In the OR, standard ASA monitors were attached. Oxygen supplementation was through nasal prongs at 4L/min. IVF Ringer lactate was given according to Holiday and Segar formula. Inj Midazolam 1mg was given at the start of the procedure. Patient had muscle spasms and dystonia during the procedure which was managed with further boluses of inj.midazolam and inj.fentanyl. There was no desaturation during the procedure. He was shifted back to PICU after the procedure with stable vitals.

Discussion: Anaestheic considerations include worsening of neurological symptoms, bulbar palsy and aspiration. Airway management may be complicated due to dystonia of neck.

Main anaesthetic goals are to avoid any triggers for the precipitation of status dystonicus such as pain, dehydration etc and to avoid mechanical ventilation as it can result in difficult weaning from ventilator.

Reference:

Allen NM, Lin JP, Lynch T, King MD. Status dystonicus: a practice guide. Dev Med Child Neurol. 2014;56(2):105–12.

Learning points: Proper preoperative evaluation, identifying dystonia state, treating it and ensuring airway protection and ventilation are crucial.

The Geriatric Patient

23AP01-1

Trends in time-sensitive pathologies in medical ICU patients over 80: a comparison of 2005-2009 and 2015-2019

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Background and Goal of Study: 15 years of progress in medical science and technology had a huge impact on how we treat patients. However, it is unclear if this progress results in better outcomes, especially for very old patients. A previous study at our ICU showed time sensitivity in admission of very old patients depending upon admission diagnosis. Early ICU mortality was higher when indirectly admitted for congestive heart failure (CHF), COPD-exacerbation (COPD-E) and pneumonia, but not for acute myocardial infarction (AMI), cerebrovascular accident (CVA) and sepsis. This discrepancy was attributed to the presence of standardized guidelines for the latter.

Our goal was to study changes in demographics, ICU length of stay (LOS), SAPS II and mortality in very old ICU patients (>80y) with APACHE IV-admission diagnoses of AMI, CVA, sepsis, CHF, COPD-E, and pneumonia between 2005-2009 (05-09) and 2015-2019 (15-19).

Materials and Methods: This retrospective cohort study was conducted in az Sint-Blasius, Dendermonde, Belgium, a general hospital with a 12 beds mixed medical-surgical ICU. A query in the ICU database, identified all patients over 80y old admitted between 05-09 and 15-19. Patients diagnosed with CVA, CHF, AMI, sepsis, COPD-E or pneumonia were included. Demographics, LOS, SAPS II and mortality were analyzed using chi-square and Mann-Whitney U tests (p < 0.05).

DRIGINAL COHORT	05-09	25-29	
	N = 258	N = 300	
ge (years, median)	03 (02/6.4)	84 (ICR 5)	P = 0.006
lex (M/F)	129/130	341/359	P=0.538
OSICJ (days, median)	8 (COR 8)	N(Q82)	P+0.025
APST sore (median)	41((Q4.23)	37(IQR 13)	P =0.0000
loupital Mortality (Death in KOL/Death in Houp/Oricharged alive)	29/14/171	22/87/211	P = 0.266
STRATIFICATION			
MMI, CVA & Sepsis	N-124	N=127	
Age (years, median)	80 808 50	84 (ICR 6)	P-0018
les (M/F)	61/63	52/75	P = 0.389
OSICU (days, median)	3 (IQR 3)	2 (ICR 1)	P=0.023
APS I score (median)	37 (IQR 24.5)	25 (ICR 16)	P= 0.0007
loop tal Mortality (Death in IOL/Death in Hosp/Oscharged alive)	19/23/92	7/26/94	P-0019
DIF, COPD E & Perumenia	N=234	N=173	
Apr (years, median)	85 (ICR 4)	89 (ICA 6)	F = 0.09
les (M/F)	62/62	89/84	P=0.801
.05 ICU (days, median)	4 (10) (8)	3-(CR3)	P=0.324
APS I sore (median)	42.5 (IQR 19)	37 (IC(R 11)	P = 0.0002
toughtal Mortaliny (Seath in ICL) Seath in Houg Studyaged alive!	10/35/99	25/41/117	P+ C-848

Results and Discussion: Patients were older in 15-19, though not clinically significant, and SAPS-II scores indicated higher sickness levels in 05-09. No overall differences were observed in LOS or mortality between the periods. However, LOS was significantly longer in 05-09 for both AMI/CVA/sepsis and CHF/ COPD-E/pneumonia cohorts. Mortality was higher for AMI/ CVA/sepsis during this period, but unchanged for CHF/COPD-E/pneumonia.

Conclusions: ICU patients today are generally older with more comorbidities. Hospitals have become more selective in ICU admissions for the elderly, focusing on cases with realistic treatment benefits. Enhanced guidelines for certain time-sensitive conditions, like AMI and sepsis, have contributed to improved outcomes, reducing mortality rates compared to earlier years.

23AP01-2

Detailed nutritional assessment improves preoperative risk assessment of elderly patients to prevent postoperative complications

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Background and Goal of Study: In previous work, malnutrition was shown as a risk for preoperative complications, delirium and mortality. However, screening elderly persons with validated and standardised tests may be challenging and shows low sensitivity especially for deficiency of specific nutrients.

The goal of this subcohort was to identify nutritional biomarkers associated with frailty and delirium.

Materials and Methods: Gertrud is a study project investigating the prevention of the perioperative neurocognitive disorder and postoperative complications by a multi-component, nursery-led intervention. After obtaining informed consent, orthogeriatric patients aged 70 years or older were assessed preoperatively for frailty and cognition.

Patients at risk (frailty or cognitive impairment or a combination of both) were randomised to receive a nurse-led intervention at least 7 days before the day of surgery including a multimodal nutritional assessment. Delirium was assessed with the 4A's Test postoperatively.

Results and Discussion: In total, more than 300 patients were included. Until today, 130 were randomised for an intervention with 40 patients with a full dataset of at least two nutritional assessments before surgery. 24 patients were female, 16 male with a median Clinical Frailty Score of 5 (25th-75 percentile 4-6). They mostly showed a normal or obese body shape with a median body mass index (BMI) of 26.2 kg*m2*-1, (24.7-31.7).

Cognition was slightly impaired (MiniCog 3 out of 5; 1,5-5). Incidence of delirium was not different between the intervention and control group. Detailed results of the nutritional assessments and biomarkers will be analysed and presented in detail. However, regarding its power, the study should be interpreted with caution.

Conclusion(s): A detailed nutritional assessment may help to improve the risk assessment of elderly patients and prevent complications, however the incidence of delirium was not improved by the nutritional intervention.

23AP01-3

Survival with preserved care level after emergency laparotomy in octogenarians and nonagenarian - a retrospective cohort analysis

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Background and Goal of Study: Despite the global shift towards patient-centered care and outcomes, most studies evaluating emergency laparotomy in older adults focus on survival, overlooking postoperative quality of life and functional status. We therefore aimed to evaluate the incidence and to identify factors that characterize survival with preserved care level after emergency laparotomy in octogenarians and nonagenarian.

Materials and Methods: We performed a retrospective analysis of patients 80 years and older who underwent emergency laparotomy at a single tertiary academic center from January 2017 to July 2021. Survival with preserved postoperative care level was defined as survival with discharge to the same level of care as the pre-admission level. To avoid non-random exclusion of patients who died during hospitalization, in-hospital mortality was considered as increased level of care.

We conducted several subgroup analyses. First, we explored and characterized maintenance of independence among patients previously living independently at home. We also assessed and described characteristics of preserved care level specifically among survivors

Results and Discussion: Among 283 included patients (median age 87 years), 91 (32%) survived with preserved care level. Of the 192 patients considered to have postoperative increased level of care, 113 (59%) met the outcome definition due to survival with increased level of care at discharge and 79 patients (41%) due to in-hospital mortality.

Among 162 previously independent patients, 39 patients (24%) survived with maintenance of independence. Among 204 survivors, 91 patients (45%) were discharged with preserved level of

Conclusions: Only 1 of 3 patients in our cohort survived with preserved functional status. Moreover, among previously independent patients, only 1 of 4 patients survived with maintenance of independence [SPH1]. Less than half of survivors were discharged with a functional status that allowed them to return to preoperative level of care.

The considerably low rate of survival with reasonable functional outcome found in our study might suggest an unfavorable harmbenefit ratio of surgical interventions in certain cases. Whether surgical treatment in these cases contributes to survival at the cost of diminished quality of life, becomes pertinent.

23AP01-4

Association between postoperative delirium in the post-anesthesia care unit and subsequent delirium in the surgical ward: a retrospective cohort analysis

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Background and Goal of Study: Postoperative delirium (POD) is a frequent complication among older surgical patients and is associated with increased morbidity, mortality, and healthcare costs. Early identification of POD during the immediate postoperative period offers a critical window for intervention.

We aimed to evaluate the association between POD diagnosed in the post-anesthesia care unit (PACU-POD) and subsequent POD in the surgical ward (ward-POD). We sought to explore the predictive value of 4A's test scores (4AT) in risk stratification.

Materials and Methods: W retrospectively analyzed data of patients ≥70 years who had elective non-cardiac surgery in a tertiary center between 2020 and 2021. Routine POD screening using the 4AT was implemented in the PACU and during the first two postoperative days in surgical wards. The 4AT scoring system ranges from 0 to 12, where a score ≥ 4 indicates POD.

Patients were categorized into four groups based on PACU 4AT scores: (1) no POD (4AT=0), (2) subsyndromal POD (4AT 1-3), (3) early PACU-POD (one hour from admission), (4) and late PACU-POD (at PACU discharge and Aldrete score of 9).

The primary outcome was ward-POD.

Secondary outcomes included discharge to non-home facilities and 1-year mortality. Multivariable logistic regression models were built to adjust for potential confounders.

Results and Discussion: Of 2,764 included patients, 9% (n=238) experienced PACU-POD, and 7% (n=198) had ward-POD, PACU-POD was significantly associated with ward-POD (aOR 4.8; 95% CI 3.3-7.2). Risk stratification revealed a graded relationship between PACU 4AT scores and ward-POD risk: patients with no PACU-POD (4AT=0) had the lowest incidence (4%; n=51).

Subsyndromal POD (7%; aOR 1.6; 95% CI 1.1-2.5), early PACU-POD (27%; aOR 4.8; 95% CI 3.2-7.1), and late PACU-POD (46%; aOR 9.8; 95% CI 4.0-24.2), all compared to the control group with no PACU-POD. PACU-POD was also associated with prolonged hospital stay, higher 1-year mortality (19%; aOR 1.7; 95% CI 1.1-2.7), and a trend toward non-home discharge (14%; aOR 1.2; 95% CI 0.8-1.9).

Conclusion(s): PACU-POD is a strong predictor of ward-POD and other adverse outcomes, emphasizing the importance of routine delirium screening in PACU. Incorporating 4AT-based risk stratification in perioperative protocols could guide early interventions. Further research should focus on targeted prevention strategies for high-risk subgroups identified by PACU 4AT scores.

23AP01-5

Five years of the cognitive impairment and postoperative delirium (CIPOD) quality improvement project: advancing perioperative cognitive, frailty, and delirium care

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Background and Goal of Study: Postoperative delirium (POD) is a common complication among older surgical patients and is associated with significant morbidity, mortality, and healthcare costs. The Cognitive Impairment and Postoperative Delirium (CI-POD) quality improvement project, initiated in 2020, aimed to routinely identify preoperative cognitive impairment, frailty, and POD using validated tools, monitor POD trends, and improve perioperative care outcomes.

This study summarizes five years of CIPOD data, evaluating its clinical impact and highlighting areas for improvement.

Materials and Methods: This retrospective study included data from 8,081 patients aged ≥70 years who underwent preoperative screening between 2020 and mid-2024 at a tertiary hospital. Screening tools included the Mini-Cog for cognitive impairment (scores ≤2 indicating impairment) and the five-item modified frailty index (5-mFI, scores ≥2 indicating frailty). POD was assessed using the 4A's tool (4AT) in the post-anesthesia care unit (PACU) and on the first and second postoperative days in the surgical wards, with scores ≥4 indicating POD. Trends were analyzed using year-by-year comparisons, with P < 0.05 considered significant.

Results and Discussion: Among 8,081 screened patients, the median age was 76-77 years, with 69-72% aged 70-79. Most patients (44-55%) were ASA II. Frailty prevalence decreased from 43% in 2020 to 38% in 2024 (P = 0.04).

Preoperative cognitive impairment ranged from 17% to 21%, with a downward trend (P = 0.04). POD incidence decreased significantly, with PACU-POD dropping from 8.5% to 4.1% (p<0.001), ward-POD from 3.6% to 2.8% (p=0.17, trend, non-significant), and overall POD incidence fell from 10.9% in 2020 to 6.0% in 2024 (p<0.001) - a 45% reduction.

These trends reflect enhanced preoperative optimization and perioperative management, driven by the CIPOD initiative's emphasis on systematic screening and multidisciplinary awareness, education, and engagement.

Conclusion(s): The CIPOD project demonstrated the value of integrating cognitive, frailty, and delirium screening into routine perioperative workflows, achieving a significant reduction in POD incidence over five years.

While screening compliance remained high (≥89%), challenges persist in managing high-risk and severely frail patients. Future efforts should focus on targeted interventions and broader implementation of quality improvement strategies to improve outcomes.

23AP01-6

Detecting postoperative neurocognitive disorder in older adults following elective surgery: development of a short test battery

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Background and Goal of Study: Postoperative neurocognitive disorder often affects older adults following surgery. To date, no practical instrument exists for routine clinical use to diagnose this subtle decline in cognitive function. The gold standard, neuropsychological assessment (NPA), takes 60-90 minutes to administer and existing brief cognitive screeners appear inadequate for the diagnosis of PNCD.

Therefore, the aim of this study was to construct a short test battery of existing cognitive tests for the detection of PNCD.

Materials and Methods: To identify the optimal subset of tests from the NPA, an existing database containing pre- and postoperative NPA data was used. Patients were aged 65 years or older and underwent elective surgery at the Amsterdam University Medical Centre. PNCD was defined as a decline of at least one standard deviation from the preoperative test score in two or more tests.

After checking for multicollinearity, 17 subtests across five cognitive domains were used as candidate predictors in a logistic rearession model.

Backward selection, guided by the Akaike Information Criterion, was used to identify the best subset of tests. Reliability of the model was assessed by evaluating discrimination and calibration.

Results and Discussion: In total, 77 patients completed pre- and postoperative NPA and 32 (42%) patients were diagnosed with PNCD. After backward selection, a combination of three tests (Stroop, Digit Span, and Auditory Verbal Learning Test) was identified as the best subset, requiring 20-24 minutes to administer. This battery achieved an area under the receiver operating characteristic curve of 0.91 (95%Cl 0.83 - 0.98) before and 0.86 (95%CI 0.78 - 0.97) after internal validation.

Conclusion: We have developed a short test battery of three cognitive tests for the diagnosis of PNCD in older adults. Administration of the battery before and after surgery can inform on changes in cognitive function in the perioperative period. Further research is needed to validate this test battery in independent datasets.

23AP01-7

Machine vs anaesthesiologist: who can better predict delirium?

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Background and Goal of Study: This study aims to compare the effectiveness of the PIPRA algorithm against clinical assessments by anesthesiologists in predicting postoperative delirium (POD).

Materials and Methods: Conducted as a multicentric prospective cohort study (Protocol NCT05639348) across three major hospitals in Switzerland since November 2022, the study includes patients aged 60 years and older with a planned postoperative stay of at least two days.

Exclusion criteria encompassed preoperative delirium, limited proficiency in German or French, recent intracranial or cardiac surgery, or surgery within the past two weeks.

During pre-anesthetic consultations, experienced anesthesiologists independently assessed each patient's risk of delirium, which was also evaluated using the PIPRA algorithm.

Postoperatively, patients were systematically monitored for POD using the 4 "A" Test, with assessments conducted twice daily for the first five days.

Results and Discussion: A total of 993 patients were enrolled, of whom 894 were evaluated using both the PIPRA algorithm and anesthesiologist assessments. The anesthesiologists had a mean of 7.9 years (SD 3.8 years) of medical training, including 4.23 years (SD 4.1 years) in anesthesia. The predictive performance of the anesthesiologists for POD was found to have an area under the curve (AUC) of 0.7 (95% CI: 0.65-0.74), while the PIPRA algorithm achieved an AUC of 0.73 (95% CI: 0.68-0.77).

Conclusion(s): In conclusion, the PIPRA algorithm demonstrates predictive accuracy comparable to that of experienced anesthesiologists, suggesting it is a reliable tool for assessing the risk of delirium in the perioperative setting.

23AP01-8

The protective role of overweight body Mass **Index on Postoperative Delirium: Evidence Supporting the Obesity Paradox**

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Background and Goal of Study: Postoperative delirium (POD) is a common complication in older surgical patients, affecting recovery, healthcare utilization, and mortality. The "obesity paradox," where increased Body Mass Index (BMI) is associated with better outcomes in certain contexts, is underexplored in POD.

This study aimed to evaluate the association between BMI and POD, focusing on the potential protective role of overweight BMI.

Materials and Methods: A retrospective cohort study analyzed data from the Cognitive Impairment Postoperative Delirium (CI-POD) project database (2020-2021) at a tertiary hospital. Patients ≥70 years who had elective surgical procedures were included, excluding those with missing BMI values, preexisting dementia, or direct ICU admissions. Patients were categorized into six BMI groups: underweight (<18.5), normal (18.5-24.9), overweight (25-29.9), obesity class I (30-34.9), class II (35-39.9), and class III (>40).

The primary outcome was overall POD, with secondary outcomes including PACU-POD, ward-POD, one-year mortality, and nonhome discharge. Multivariate logistic regression adjusted for confounders, with normal BMI as the reference group.

Results and Discussion: A total of 2,872 patients were included, with an overall POD incidence of 13% (367 cases). Overweight BMI (25-29.9) was associated with a lower overall POD rate compared to normal-BMI patients (12% vs 14%, adjusted odds ratio (aOR)=0.74; 95% CI [0.6-0.9], p=0.03). All other obesity categories did not demonstrate significantly different POD rates compared to the control group.

Mortality decreased with increasing BMI. Overweight and obesity class I patients had significantly lower mortality compared to normal BMI (11% and 9% vs. 15%; aOR=0.72, 95% CI [0.5-0.9], p=0.017 and aOR=0.51, 95% CI [0.3-0.8], p=0.001, respectively). All other obesity categories did not have significantly different mortality rates compared to the control group. Non-home discharge rates were not different across BMI categories.

Conclusion(s): Our findings support the "obesity paradox," with overweight and obesity class I patients benefiting from reduced risk of POD and mortality, likely due to improved metabolic and nutritional reserves.

However, the benefits diminish in obesity class II and III patients, as well as in underweight patients, where increased frailty and comorbidity burden might offset protective effects. Future research should investigate prehabilitation strategies to optimize BMI and enhance outcomes for older surgical patients.

23AP01-9

Clinical efficacy of hypotension prediction Index based protocolized hemodynamic management in geriatric orthopedic surgery: a prospective randomized controlled trial

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Background and Goal of Study: Perioperative hypotension is a critical factor influencing postoperative outcomes, such as acute kidney injury (AKI) and postoperative cognitive dysfunction. This issue is particularly concerning in older adults. The Hypotension Prediction Index (HPI) has shown promise in predicting and mitigating intraoperative hypotension.

This study investigates the clinical efficacy of HPI-guided hemodynamic management in older patients undergoing orthopedic

Materials and Methods: This prospective randomized controlled trial enrolled patients aged ≥ 60 years undergoing elective orthopedic surgery under general anesthesia. Participants were randomized into two groups: standard care and HPI-guided therapy. Continuous hemodynamic monitoring was performed using minimally invasive Acumen IQ sensors. Hemodynamic parameters were targeted to maintain a mean arterial pressure (MAP) ≥ 65 mmHg and a stroke volume variation (SVV) < 13% using fluid challenges and intravenous norepinephrine infusion.

Additionally, in the HPI group, the HPI was maintained below 85. Key outcomes included the incidence of AKI, perioperative hemodynamic stability, and perioperative changes in neurocognitive test scores, assessed with the Quick Mild Cognitive Impairment (Qmci) test.

Results and Discussion: A total of 68 patients were enrolled, including 35 in the control group and 33 in the HPI group, with a mean age of 70 years. Patients in the HPI group received nonsignificantly higher doses of norepinephrine [17 (1-54) vs. 12 (1-43) mcg; p = 0.090], but intraoperative MAP was maintained comparably between the two groups (83 \pm 7 vs. 82 \pm 7 mmHg for the control and HPI groups, respectively; p = 0.833). AKI developed in 6 patients in the control group (17.1%) and 2 patients in the HPI group (6.1%) (p = 0.260). No significant differences were observed in perioperative Qmci test scores between the two groups. The lack of significant impacts on clinical outcomes may be due to the HPI alerting only at the MAP threshold of 65 mmHg, which may be too low for geriatric populations. Thus, the current utility of HPI may be limited in older adults unless a more flexible MAP threshold can be tailored to individual patients.

Conclusion(s): The HPI-guided intraoperative hemodynamic protocol was not effective in maintaining higher MAP during surgery or in reducing the incidence of AKI and postoperative neurocognitive decline in geriatric patients undergoing orthopedic surgery.

23AP01-10

Incidence and risk factors of extremely poor functional outcome after burr-hole evacuation of chronic subdural hematoma in octogenarians and nonagenarians - a retrospective cohort analysis

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Background and Goal of Study: Most studies evaluating burrhole evacuation of chronic subdural hematoma (CSDH) in older adults focus on mortality, and only few describe patient-centered outcomes. Data on survival with extremely poor functional outcome remain scarce. We aimed to evaluate the incidence of extremely poor functional outcome after burr-hole evacuation of CSDH in octogenarians and nonagenarians, and to describe associated risk factors.

Materials and Methods: We performed a retrospective analysis of patients ≥80 years who underwent burr-hole evacuation for the treatment of CSDH at a single tertiary center from January 2017 to July 2021. Extremely poor functional outcome was defined as Glasgow Outcome Scale - Extended (GOSE) ≤ 3. Multivariable logistic regression models were used to identify independent risk factors for the primary outcome.

Results and Discussion: Among 153 included patients (median age 85 years), 64 patients (42%) had extremely poor outcome. Of these, 52 patients (81%) met the outcome definition due to GOSE=3 at discharge (survival with total functional dependency), and 12 patients (19%) due to GOSE=1 (died during hospitalization). Independent risk factors for such poor outcome were prehospitalization non-independent living status and pre-existing high burden of comorbidities, with adjusted odds ratios of 6.80 (95% CI 1.96-23.59) and 5.54 (95% CI 1.71-17.91), respectively.

Conclusion(s): Older adults undergoing burr-hole evacuation of CSDH have a significant rate of extremely poor outcome, mostly due to survival with total functional dependency, suggesting an unfavorable harm-benefit ratio of surgical intervention in certain cases. Future research should aim to further establish and validate patient-centered endpoints among older adults with CSDH.

23AP02-1

Changes in electroencephalogram waveforms in elderly patients with severe dementia after administration of midazolam: changes in waveform and amplitude

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Background and Goal of Study: We have previously reported that intravenous sedation using midazolam in elderly patients with dementia often results in different responses from healthy populations. In this study, we measured how electroencephalogram (EEG) components change after administration of midazolam to elderly patients with dementia.

Materials and Methods: The study protocol was approved by the institutional research board and ethics committee of Kanagawa Dental University (approval number 735). Elderly subjects aged 60 years or older were enrolled, and subjects with the Mini Mental State Examination (MMSE) score of 23 or less were considered to have dementia.

Furthermore, patients with Functional Assessment Staging of Alzheimer's Disease stage≥6 and/or Clinical Dementia Rating of "severe" were registered as severe dementia. On the other hand, those with MMSE≥24 were considered to have no dementia. EEGs were measured using MWM20® (GMS Co., Ltd. Japan), and delta, theta, alpha and beta waves were identified by power spectrum analysis.

These parameters were measured and compared at three points: before midazolam administration (baseline value), when midazolam was administered and an OAA/S score of 2 was obtained, and just before the start of dental treatment. These data were compared between the dementia and non-dementia patients. Noise was removed from the EEG data by visual inspection, and the data during 10 seconds when the EEG was stable at each measurement time were used. The non-parametric tests were used as statistical analysis. P<0.05 was considered as significant.

Results and Discussion: The subjects' ages were 83.5 years (median) in the dementia group and 73.0 years in the non-dementia group. There were one male and 10 females in the dementia group, and 4 males and 7 females in the non-dementia group. In comparison between the dementia and the non-dementia group, higher delta and theta waves amplitude and lower alpha wave amplitude at baseline were suggested in the dementia group.

The amplitude of alpha and beta waves were lower and delta wave was higher after administration of midazolam in the dementia group. In comparisons within each group, the amplitude of theta wave in both the dementia group and the non-dementia group reduced after administration of midazolam.

Conclusions: Differences were observed in the changes in EEG waveform and amplitude between the elderly populations with and without dementia after administration of midazolam.

23AP02-2

Alterations in patient profiles without effect on short-term or long-term mortality among elderly intensive care unit patients from 2005 to 2019: a retrospective cohort analysis in Belgium

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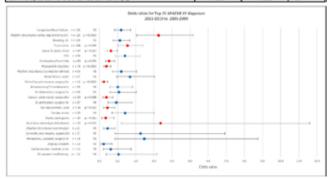
Background and Goal of Study: From 2005 to 2019, ICUs noticed a significant shift in healthcare trends and patient demographics. The intricacy and acuity of ICU patients increased, with more patients with multiple comorbidities and advanced age. Technological progress enabled treatment of increasingly older patients. However, it is unclear whether Very Old Intensive Care Patients (VIPs) benefit from this progress.

Goal: to study changes in demographics, case mix and mortality in VIPs, comparing 2005-2009 (05-09) and 2015-2019 (15-19).

Materials and Methods:

Setting: 12-bed mixed medical-surgical ICU at az Sint-Blasius, Dendermonde, Belgium. A database query identified all VIPs admitted between 05-09 and 15-19. Cross-matching with the Belgian National Register provided actual vital status or date of death. To avoid bias from repeated ICU admissions, we excluded VIPs readmitted within 12 months before final admission. Data: age, sex, APACHE IV admission diagnosis, SAPS II score, mortality. Statistics: Chi-square, Mann-Whitney U-test, Kaplan-Meier survival analysis with log-rank test. Statistical significance: p < 0.05.

Demographics & Outcomes	05-09	15-19	Statistics
Admissions >80 years (n)	747	1066	p < 0.0001
Age (years, median, interquarble range)	83 (IQR 4)	84 (IQR 5)	p = 0.022
Sex (M/F)	333/414	511/555	N5
Length of stay in ICU Idays, median, interquartile range)	3 (10 ft 2)	2 (IQR 2)	p < 0.0001
Hospital Admission Type (Emergency Surg/Planned Surg/Modical)	91/169/487	119/150/797	p < 0.0001
SAPS II score (median, interquartile range)	36 (KLR 20)	35 (ICR 17)	p = 0.091
Hospital Mortality (Death in ICL//Death in Hospital//Discharged alive)	75/116/556	105/140/821	N5
Survival up to 12 months after ICU admission (%)	0.596	0.616	NS



Results and Discussion: 747 vs. 1066 admissions were analyzed. In 15-19 significantly more VIPs were admitted to ICU. Median age was older in 15-19, but length of stay and SAPS II score were

lower. Sex did not differ neither did mortality in ICU, in hospital and survival up to 12 months after ICU admission. Case-mix changed significantly: more admissions for atrial rhythm disturbance, pneumonia, and acid-base electrolyte disturbances, fewer admissions for sepsis/septic shock, cardiogenic shock, COPD exacerbation, AMI, and certain surgical diagnoses (pelvis/hip fracture, colorectal cancer, hip replacement).

Conclusion(s): Because of the aging population, the number of VIPs admitted in ICU is increasing, as is their median age. However, mortality did not change. Our presumption that survival of VIPs improved during 15 years of medical progress, seems incorrect, but could have been influenced by multiple biases. To rule out bias by age, case-mix or acute physiology changes, analysis with logistic regression or propensity score matching is warranted.

23AP02-3

The association between myocardial injury and 90-day mortality after hip fracture surgery- a retrospective cohort analysis

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Background and Goal of Study: The association between myocardial injury after non-cardiac surgery (MINS) and postoperative mortality has been well established in elective surgical patients. However, data regarding this association among elderly patients having hip fracture repair are scarce.

We therefore aimed to investigate the association between MINS and postoperative 90-day mortality in patients≥65 years having surgical hip fracture repair.

Materials and Methods: We conducted a retrospective cohort study in a large volume tertiary medical center between May 2020 And June 2022. MINS was defined as a peak high sensitive cardiac troponin I above the 99th percentile of the upper reference limit, routinely measured in this population during the first 72 postoperative hours, presumed to be of an ischemic origin. The association between MINS and postoperative 90-day mortality was evaluated using multivariable regression models.

Results and Discussion: A total of 698 patients were included (median [interquartile range, IQR] age 84 [77, 90] years; 68% females; 68% ASA physical score 3-4). We found a 24% (165 patients) incidence of MINS. The overall 90-day mortality rate was 6% (n=41 patients).

After adjustment for potential confounding variables, MINS was associated with 90-day postoperative mortality (adjusted odds ratio [aOR] 2.05, 95% confidence interval [CI] 1.05-3.99, p=0.036).

The time from emergency room admission to the operating room was not significantly associated with 90-day post-operative mortality (aOR 1.16, 95% CI 0.44-3.10, p=0.766).

Conclusions: Our results suggest that MINS is independently associated with postoperative 90-day mortality in elderly hip fracture surgical patients, concomitant with previous studies that investigated this association among other surgical populations. Considering the deleterious consequences associated with

MINS, and the high mortality rates following hip fracture surgery repair, routine troponin measurements after these surgeries may have an important role in improving postoperative outcomes.

23AP02-4

The identification of orthostatic hypotension in preassessment

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Background and Goal of Study: Orthostatic hypotension (OH) is a common cardiovascular condition affecting 5-30% of older community-dwelling adults, with higher prevalence in those with comorbidities¹.Despite its potential significance in perioperative outcomes, the implications of OH in surgical settings remain largely unexplored, particularly regarding intraoperative haemodynamics and postoperative complications. Understanding these perioperative implications could help improve risk assessment, patient safety, and outcomes in vulnerable surgical populations.

This work was approved as a service evaluation to examine the practicality and importance of identifying OH in older patients during preassessment clinic visits, determining its incidence, and identifying high-risk groups among patients aged 65 years and older undergoing intermediate or major elective non-cardiac suraerv.

Materials and Methods: A prospective evaluation of 100 patients aged ≥65 years was conducted at St James's University Hospital's preassessment clinics. Data collection included demographics, Clinical Frailty Scale scores, comorbidities, antihypertensive medication use, and orthostatic blood pressure measurements, defined as a ≥20 mmHg drop in systolic or ≥10 mmHg in diastolic blood pressure within 3 minutes of standing. Statistical analysis employed descriptive statistics, chi-square tests, and univariate analyses.

Results and Discussion: OH was present in 42% of participants, significantly higher than community prevalence rates. A strong association was found between OH and frailty levels (p <.001), with higher OH prevalence in vulnerable (41.2%), mildly frail (81.8%), and moderately frail (100%) patients. Diabetes mellitus was significantly associated with OH (p = 0.037), while age, sex, and other comorbidities showed no significant associations.

Conclusion(s): The high prevalence of OH in preoperative older adults, particularly those with increased frailty or diabetes, suggests the need for routine OH screening in preoperative assessments. Special attention should be given to patients with higher Clinical Frailty Scale scores or diabetes mellitus.

Further research is needed to develop risk prediction models and evaluate the impact of preoperative OH management on surgical outcomes.

Reference:

1. Ricci, F., De Caterina, R. and Fedorowski, A., 2015. Orthostatic hypotension: epidemiology, prognosis, and treatment. Journal of the American College of Cardiology, 66(7), pp.848-860.

23AP02-5

Combined spinal-epidural anesthesia associated with peripheral nerve blocks for total hip arthroplasty in a patient with decompensated heart failure with reduced ejection fraction (HFrEF) and metastatic lung cancer

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Background:

Anesthetic management in elderly patients with multiple comorbidities is challenging. This case involves a patient with metastatic lung cancer, decompensated heart failure, COPD, coronary artery disease, and DNI/DNR directives.

Case Report:

A 71-year-old male with metastatic lung carcinoma, heart failure (EF 23%) with 1700 ml of pleural effusion drained the day before surgery, type 2 diabetes, atrial fibrillation, COPD, and an implanted unactivated CDI presented for total hip arthroplasty after a pathological femoral fracture. He had a history of myocardial infarction and was on anticoagulation therapy.

He presented to the OR with 83% SpO2 on room air, 90/50 mmHg blood pressure. Due to cardiovascular instability, spinal anesthesia alone was avoided. The anesthetic approach included:

- 1. Femoral nerve block: 15 ml of 1% lidocaine. allowing adequate patient positioning for neuraxial anesthesia
- 2. PENG block: 20 ml of 0.375% ropivacaine
- 3. Combined spinal-epidural: 5 mg isobaric bupivacaine intrathecally and 4 ml of 0.2% ropivacaine intermittently via epidural catheter, plus 2 mg of morphine at the end of surgery

The surgery was uneventful, with 500 ml of fluid administered and 600 ml of urine output. The epidural catheter was removed promptly to ease the reintroduction of anticoagulants. The patient was transferred to ICU and ambulated 48 hours later with minimal pain and no complications.

Discussion:

Individualized anesthetic management is paramount for high-risk patients. Regional techniques, combined with careful sedation, provide effective analgesia and minimize the risks of general anesthesia and extubation failure. This approach respects the patient's will to avoid invasive interventions and offers a safer alternative to general anesthesia.

Reference:

Bui, Michael et al. "Systematic review and meta-analysis of preoperative predictors for early mortality following hip fracture surgery". Osteoporos Int. 2024;35(4):561-574. doi:10.1007/ s00198-023-06942-0

Learning Points: The dual block technique combines the hemodynamic stability of neuraxial anesthesia with the prolonged analgesia of peripheral nerve blocks.

This approach avoids airway manipulation, reduces systemic risks, and provides effective pain relief. It aligns with palliative care principles by ensuring patient comfort while minimizing invasive interventions, offering a safe and effective strategy for frail patients with severe comorbidities requiring urgent surgical intervention.

23AP02-6 Quality of preoperative patient education in older adults (PREDOL)

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Background and Goal of Study: The patient's informed consent to treatment is a prerequisite for any medical intervention and is required by law and by ethical standards. Informed consent is a construct of information exchange, understanding and voluntariness. Little is known how older adults, especially those with cognitive impairment, perceive preoperative education and if the criteria of informed consent are met in these patients.

Here, we evaluated perception of anaesthesiologic education in patients ≥65 years, comparing their views with those of physicians.

Materials and Methods: Patients were enrolled at the University Medical Centre Hamburg, following questionnaires were applied: Information and understanding: COMRADE (Combined Outcome Measure of Risk Communication and Decision Evaluation), DEC (Decision Evaluation Scale); voluntariness, participation: PIC (Perceived Involvement in Care Scale). Autonomy, health literacy and functionality: API (Autonomy Preference Index); HLS (European Health Literacy Survey); WHODAS2.0 (Section one of the WHO disability assessment schedule).

Physicians' perception of informed consent criteria and comparison with the patients' perspective was assessed. Analysis was carried out using Spearman's correlation test and two-sided T-

Results and Discussion: 150 patients (mean age 74, 33% female) and 37 anaesthesist were enrolled. Information and understanding were achieved at a rate of 90% (45/50, SD 5,35, COMRADE), compared to 47% (9/20, SD 3,12, PIC) for participation and voluntariness. While 84% of patients stated a high demand for information (33/35, SD 3,61, API), this was only recognized by 27% of anaesthesists.

Furthermore, physicians were more likely than their patients to believe that the decisions should be physician-led (62% vs 38%, p < 0.01). Patients with self-reported cognitive impairment were less satisfied with received risk education than cognitively unimpaired patients (26/30, SD 4,54, WHODAS; p=0,04).

Criteria of informed consent were more often met in patients with low level of education and health literacy (12/16, SD 5,02, HLS) due to a reduced autonomy preference (33/35, SD 3,5, API; p>0,03).

Conclusion(s): Informed consent has only been partially achieved from elderly patients' perspective due to the lack of involvement; physicians rated their consultations as more informative and interactive than the patients. Accordingly, participation of the elderly in medical decisions should be encouraged.

23AP02-7

Comparison of two different tests in diagnosing postoperative delirium in elderly patients

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Background and Goal of Study: Postoperative delirium is an acute or subacute, usually reversible altered state of consciousness that fluctuates throughout the day. It can occur with a prevalence of up to 55%1.

Delirium is associated with increased mortality, morbidity and healthcare costs2.

Early recognition of delirium in elderly patients undergoing surgery is important to prevent adverse outcomes3.

The aim of the study was to compare the DRS-R-98 and 3D-CAM tests used in the assessment of postoperative delirium, and to evaluate their applicability and power to detect delirium.

Materials and Methods: After obtaining the approval of the ethics committee, 270 patients aged 65 years and older, undergoing elective surgical operation longer than 1 hour were included in the study. Demographic and surgical data and postoperative followup were recorded. DRS-R-98 and 3D-CAM tests were administered on postoperative days 1 and 2 and the diagnosis of delirium was confirmed by DSM-V.

Results and Discussion: The incidence of postoperative delirium was 9. 2% (n=25). The DRS-R-98 test has a sensitivity of 80.9 -81.2% and a specificity of 98. 8-100%; the sensitivity and specificity of the 3D-CAM test were 100% and 98.4- 99 6%, respectively.

A significant difference was observed between the delirium + and - groups in terms of median age, ASA score, history of cerebrovascular events and arrhythmia, hearing aid use, median body mass index, education level, postoperative intensive care unit stay and total hospitalization (p<0.05).

In regression analysis, advanced age, history of cerebrovascular events, low education level, low BMI and long total hospitalization were associated with increased risk of delirium (p<0.05).

Conclusion(s): 3D-CAM and DRS-R-98 tests, whose specificity and sensitivity we compared with the gold standard DSM-V, seem to be reliable diagnostic methods.

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- 3. Janssen, T., et al., Prevention of postoperative delirium in elderly patients planned for elective surgery: systematic review and meta-analysis. Clinical interventions in aging, 2019: p. 1095 1117.

Emergency laparotomy in the elderly: A 6-month audit of outcomes in Emergency **Laparotomy and Laparoscopic Scottish Audit** (ELLSA) patients aged 65 and over in a Scottish **Tertiary Major Trauma Centre**

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Background and Goal of Study: The surgical population is ageing faster than the general population and most emergency laparotomies are performed in patients aged ≥65[1]. This is a high risk group with an increased 30- and 90-day mortality and length of stay[1]. Frailty is associated with poorer outcomes and affects up to 20% of older adults undergoing emergency laparotomy thus frailty scoring is recommended in this group[2.3]. The Emergency Laparotomy and Laparoscopic Scottish Audit (ELLSA) includes frailty scoring as a Key Performance Indicator. Despite this our centre has no formal frailty scoring for emergency laparotomy patients. We aimed to establish the proportion of patients undergoing emergency laparotomy aged ≥65, compare their outcomes with the whole cohort and identify areas for improvement.

Materials and Methods: A subset of data collected for ELLSA from April - September 2024 was reviewed. Data included age, mortality risk scores (≥5% indicating high risk), post-operative critical care stay, 30-day mortality, and length of stay (LOS). Data for patients aged ≥65 were compared with the whole cohort.

Results and Discussion: 121 procedures that met ELLSA criteria were performed in the audit period. Two were excluded for incorrect recording of patient details. 53.8% of patients were aged ≥65. The results are shown in the table:

Patient group	Whole patient cohort	Patients aged ≥65	
Proportion of patients high-risk	50.4%	76.5%	
Post-operative critical care admission (level 2 or 3)	47.1%	57.8%	
30-day mortality	5.0%	7.8%	
Mean LOS	18.7 days	19.0 days	

Table. Comparison of whole patient cohort and patients aged ≥65

Conclusion(s): Over half of patients studied were aged ≥65. This group had higher mortality risk scores, admission rates to critical care, and 30-day mortality. Our data supports the introduction of formal frailty scoring in those undergoing emergency laparotomy allowing targeted interventions for older patients.

References:

- 1. Aitken, Rachel M et al. Older patients undergoing emergency laparotomy: observations from the National Emergency Laparotomy Audit (NELA) years 1-4. Age and Aging, 49(4): p656-663
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23AP02-10

The incidence of postoperative delirium in elderly urological patients, depending on the preoperative condition

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Background and Goal of Study: Elderly patients are at greater risk than other patients for postoperative delirium. The goal of this study is to assess the role of preoperative morbidity in the incidence of postoperative delirium (POD).

Materials and Methods: All patients over 65 years old who underwent surgery for TUR BT and TUR Prostate under spinal anesthesia were included in the study. The total number of patients was 740. All patients were preoperatively assessed for their mental status using the MMSE (Mini-Mental State Examination). A cutoff score of 23 was used, and patients scoring below this threshold were excluded from the study.

Additionally, for each patient, an evaluation was conducted using the Confusion Assessment Method (CAM). We use Fisher's exact test (statistical significance.p<0.05)

Results and Discussion: Out of these 740 patients, 77 had no underlying illnesses. Of those without illnesses,2 (2.5%) developed (POD). A total of 143 patients had only one illness . POD was observed in 12 (8.3%) patients overall, all of whom were over 80 years old.

On the other hand, 500 patients had two or more illnesses, POD was observed in 88 (17.6%) patients in this group. Out of 740 patients,102 (13.7%) manifested postoperative delirium. Among patients with a single preoperative illness, postoperative delirium was observed at rates between 6% and 16.6%.

Meanwhile, the highest incidence of postoperative delirium was found in patients with more than one illness (12.5% to 31%). Anemia in patients with diabetes was identified as an important factor in the incidence of postoperative delirium (31%). No Disease vs. Any Disease (One or More Diseases),p-0.0013: No Disease vs.≥2 Diseases,p-0.00017.One Disease vs. ≥2 Diseases,p-0.006. Odds Ratios(OR): No Disease vs. Any Disease: OR = 0.15 (Patients with any disease are ~6.7x more likely to develop delirium). No Disease vs. Two or More Diseases: OR = 0.12 (Patients with two or more diseases are ~8.3x more likely to develop delirium). One Disease vs. Two or More Diseases: OR= 0.43 (Patients with two or more diseases are ~2.3x more likely to develop delirium than those with

Conclusion(s): This study revealed that the greater the number of preoperative illnesses a patient has, the higher the likelihood of encountering postoperative delirium.

Additionally, the presence of anemia in patients with diabetes mellitus was identified as a significant factor in the increased frequency of postoperative delirium.(p<0.05)

Post-operative pulmonary complications in elderly sarcopenic patients undergoing thoracic

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Background and Goal of Study: Sarcopenia is a generalized muscle disorder involving strength, muscle quantity/quality and physical performance (European Working Group on Sarcopenia in Older People-EWGSOP2). It is a common pathology in the elderly and it correlates with negative post-operative outcomes such as high mortality, complications, increased hospital stay; therefore, it could be used as an index to identify patients who could benefit from a more conservative surgical approach or post-operative intensive care admission.

Our study is based on the hypothesis that sarcopenic elderly patients undergoing thoracic surgery are exposed to a greater risk of post-operative complications and short- and long-term mortal-

Materials and Methods: Patients candidates for thoracic surgery at Fondazione Policlinico Universitario A. Gemelli IRCCS were enrolled. Inclusion criteria: age ≥ 70 years old. Exclusion criteria: esophageal and emergency surgery. Patients underwent surgical, anaesthesiological, pneumological and geriatric evaluation during pre-hospitalisation, with a subsequent geriatric follow-up visit 30 days after surgery.

Primary endpoint: pulmonary complications 30 days after surgery. Secondary endpoints: other post-operative complications, intensive care unit (ICU) admission, length of stay, falls at 30 days.

Results and Discussion: We enrolled 53 patients: 26 underwent surgery; 13 underwent follow-up after 30 days. The statistical analysis was performed for the 26 operated patients, who were divided into two groups: sarcopenic (14 patients) and non-sarcopenic (12 patients).

According to our knowledge, this is the only study in the literature that analyzes the correlation between pulmonary complications and sarcopenia diagnosed by integrating radiological datas (psoas muscle index [PMI]) with clinical evaluations (hand grip, chair test, short physical performance battery [SPPB], appendicular skeletal muscle mass [AMS]), in patients aged > 70 years undergoing thoracic surgery.

Pulmonary complications (PPCs) 30 days after surgery: 42.8% of sarcopenics vs 0% of non-sarcopenics (p = 0.017). Other postoperative complications: 31.71% of sarcopenics vs 25% of nonsarcopenics (p = 0.683).

Conclusion(s): Sarcopenia diagnosed according to EWGSOP2 correlates with increased PPCs in elderly patients undergoing elective thoracic surgery. Further studies are necessary to confirm this data.

23AP03-1

Analysis of the relationship between preoperative risks in cardiac and abdominal surgery patients, taking into account the Fraility index, CFT, EFT scales and thigh muscle thickness

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Background and Goal of Study: In modern surgery, the issue of postoperative risk stratification in patients over 65 years of age is increasingly arising. Numerous studies show that with high-quality surgery, the greatest number of complications in any patient occurs in the postoperative period. This statement is based on peak oxygen consumption, physical fitness and its decline with age. The Clinical Fraility Scale (CFS) and Essential Fraility Toolset (EFT), primarily in elderly patients, are more important in predicting this period.

The main goal of the study is to analyze the prediction of postoperative complications using Fragility indicators and to identify patterns between the thickness of the thigh muscles and the severity of fragility.

Materials and Methods: 144 patients were analyzed, divided according to the profile of the underlying disease and surgical intervention into cardiac surgery and abdominal groups. 91 cardiac surgical patients from 46 to 84 years old (67 ± 6.75 years), including 29 women (31.86%) and 62 men (68.14%), who should undergo coronary bypass surgery or heart valve replacement on a cardiopulmonary bypass or on a beating heart. 53 abdominal patients from 31 to 79 years (57.73 ± 12.76 years), including 27 women (50.95%) and 26 men (49.05%), who should undergo hepatectomy of various volumes, or pancreatic duodenal resec-

The CFS and EFT scores were used to stratify postoperative risks. At the same time, the patients underwent ultrasound diagnostics of the thickness m. rectus femoris and m. vastus medius.

Results and Discussion: In cardiac group the correlation analysis revealed a significant (p <0.05), strong inverse relationship (r = -0.71) between the CFS scale indicators and thickness m. rectus femoris. Significant (p < 0.05), inverse, moderate relationships were also revealed between EFT and thickness m. rectus femoris and m. vastus medius (r= -0.56; r= -0.53), and between SFS thickness m. vastus medius (r= -0.57).

Abdominal group, a significant (p <0.05), weak inverse relationship (r = -0.35) was found between the EFT scale indicators and thickness m. rectus femoris. A significant (p <0.05), inverse, and weak relationship between CFS and thickness m was also revealed. rectus femoris (r= -0.45)

Conclusion(s): The CFS and EFT scales in cooperation with preoperative ultrasound of the thigh muscles can improve the tactics of preoperative preparation of patients in order to minimize postoperative complications.

23AP03-2

Impact of continuous pre-induction norepinephrine administration on the incidence of hypotension following propofol induction in elderly patients: the vaso-old study

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Background and Goal of Study: Postinduction hypotension (PIH) can lead to severe complications1. Older adults may be at an increased risk of PIH, particularly when vasodilatory anesthetic agents are used2.

In elderly patients, continuous vasopressor administration is often employed before anesthesia induction. However, the effect of continuous vasopressors on PIH remains unclear.

This study aimed to evaluate the impact of initiating continuous catecholamine infusion prior to propofol induction on the incidence of PIH.

Materials and Methods: This retrospective cohort study was conducted at Charité-Universitätsmedizin Berlin between December 2019, and August 2023. Patients aged ≥70 years who underwent a preoperative geriatric assessment, and received anesthesia induction with propofol for elective surgery were included. PIH was defined as a mean arterial pressure (MAP) <65 mmHg within 15 minutes after the initial propofol bolus. Continuous catecholamine administration was defined as norepinephrine (NA) delivered via syringe pump.

Multivariable zero-inflated negative binomial regression analyses were used to assess the relationship between pre-induction NA and both the duration and severity of PIH. Analyses were adjusted for age, sex, ASA physical status, MET (Metabolic Equivalent of Tasks), CCI (Charlson Comorbidity Index), antihypertensive medication, and median MAP before induction.

Results and Discussion: A total of 1,824 patients were included, with 739 (41%) receiving continuous NA before anesthesia induction and 1,085 (59%) not receiving (Table 1).

The median duration of hypotension in the NA group was 0.0 [IQR 0.0-1.0] minutes, with a median area under the curve (AUC) of 0.0 [0.0-1.8] mmHg·min-1.

In the non-NA group, the median duration was 0.0 [0.0-1.1] minutes, with a median AUC of 0.0 [0.0-1.7] mmHg·min-1. In adjusted analysis, no significant differences in hypotension duration (IRR 0.94, 95%CI 0.75-1.17, p=0.6) or AUC (IRR 1.12, 95%CI 0.81-1.54, p=0.5) were observed.

Conclusion(s): Continuous pre-induction NA administration did not significantly influence the incidence or severity of PIH following propofol induction in elderly patients.

Category	NA cohort (n = 739)	Non-NA cohort (n = 1085)	Standardized Mean Difference
Age (Years)	77 [73-81]	77 [73-81]	0.083
Sex (male)	420 (57%)	647 (60%)	0.076
ASA-Status	2 [2-3]	2 [2-3]	0.113
MET	4 [4-6]	5 [4-6]	0.2
CCI	5 [4-6]	5 [4-6]	0.118
Antihypertensive Medication	705 (95%)	1019 (94%)	0.057
Anaesthesia induction time (min)	13 [9-21]	13 [9-19]	0.158
Median MAP before anaesthesia induction	99 [91-107]	98 [91-107]	0.012
Propofol amount (mg kg ⁻¹)	1.4 [0.9-1.9]	1.5 [0.8-1.9]	0.023
Noradrenaline amount (µg kg-¹min-¹)	0.05 [0.03-0.05]	N/A	N/A

Table 1. Baseline patient and anaesthesia characteristics of the NA and Non-NA cohort.

References:

- 1. Walsh et al. Anesthesiology. 2013;119(3):507-15
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23AP03-3

Dexmedetomidine for elderlies used in one day surgery

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Background and Goal of Study: The use of combination of local anesthesia and analgosedation with short action drugs, seems that meet the requirements for safe anesthesia for aged patients. Dexmedetomidine (DM), a selective alfa -2 agonist of adrenoreceptors and remifentanil (RM) a synthetic opioid can be used for analgosedation in this type of surgery.

Materials and Methods: The use of combination of local anesthesia and analgosedation with short action drugs, seems that meet the requirements for safe anesthesia for aged patients. DM a selective alfa -2 agonist of adrenoreceptors with sympatholytic effects, and RM can be used for analgosedation in this type of

Some publications in the literature suggest the contribution of DM in peroperative inflammation and stress response and the prevention of postoperative cognitive disfunctions (PCD) in elderly people, which can meet the requirements of this type of anesthesia.

Results and Discussion: The use of optimal doses of DM, as it was advised by some authors, provided stable hemodynamic course of the patients included in this study. The titration of remifentanil also resulted in less respiratory disturbances. The operative trauma, stress factors and the separation from their homes make them liable to PCD. One of the hypotheses of this

occurrence is that an increased amount of cortisol during surgical trauma may be responsible for this. In this study the level of cortisol was increased in the group of patients sedated with RM . **Conclusion(s):** It can be concluded that DM in optimal doses provides stable hemodynamics without respiratory depression. Compared to standard remifentanil infusion DM enables better anti-inflammatory and anti-stress effect. Also can be concluded that DM is a powerful tool against the development of the PCD **References:**

- 1. Sholjakova M, Trajkova R, Durnev V, Tolevska M: Post Anesthesia Cognitive Dysfunction of Aged Patients in One Day Surgery. IJSR;2020 9(1):152-156 doi:10.21275/ART20203810 2. Liu et al. Effects of dexmedetomidine at different dosages on perioperative hemodynamics' and postoperative recovery quality in elderly patients undergoing hip replacement surgery under general anaesthesia: a randomized controlled trial. Trials 2023; 24:386 doi.org/10.1186/s13063-023-07384-z
- 3. Fondeur J, Escudero Mendez L, Srinivasan M, et al. Dexmedetomidine in Prevention of Postoperative Delirium: A Systematic Review. Cureus 2022; 14(6): e25639. DOI 10.7759/cureus.25639

23AP03-4 Opioid-free anesthesia for elderly patients: Is it safe and beneficial?

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Background and Goal of Study: The physiology and anatomy of the elderly patient undergous many changes, including lower drug metabolism and increasing side effects of most drugs, including opiod. Opioid-free anesthesia is being considered as one option for adequate anesthesia with fewer complications. This study aims to demonstrate the role of opioid-free anesthesia among elderly patients

Materials and Methods: This was a retrospective observational study from September 2023 – October 2024 in Premier Bintaro Hospital. Inclusion criteria was aged more than 65, operative duration more than 30 minutes, under general anesthesia. Exclusion criteria was admitted to ICU postoperatively. Primary outcomes were severe postoperative pain, opioid rescue analgesic needs, incidence of nausea and vomiting, and any desaturation incidence in the recovery.

Results and Discussion: There were 158 patients included in this study with 21 subjects or 13.3% had opioid-free anesthesia. Both groups spent comparable time for observation in the recovery room. Most common surgical type for both groups were spine and orthopedic surgery. As for the primary outcome, the incidence of severe postoperative pain was slightly higher among those who received opioid-free anesthesia (23.8% vs. 18.2%). There was no incidence of nausea and vomiting in opioid-free anesthesia group. There were no adverse events in both groups.

Conclusion(s): Opioid-free anesthesia served as an option for elderly patients undergoing surgery with less incidence of nausea and vomiting. However, the incidence of postoperative pain was slightly higher in comparison with those who received opioid.

References:

- 1. Yan, et al. Trials 24, 819 (2023).
- 2. Belltall, et al. BMJ Open 2024;14:e089024.

Characteristics	Opioid (n=137)	Opioid-Free (n=21)
Age (years)	70.8 ± 3.9	68.1 ± 3.15
Male	71 (51.8%)	13 (61.9%)
Duration of surgery (min)	257.5 ± 61.2	121.1 ± 55.5
Duration of recovery room (min)	65 ± 22.3	59.1 ± 18.5
Primary outcome		
Severe postoperative pain	25 (18.2%)	5 (23.8%)
Rescued opioid in the recovery room	25 (18.2%)	4 (19.0%)
Nausea and vomiting in the recovery room	5 (3.6%)	0
Desaturation in the recovery room	0	0

Table Comparison between subjects who received opioid and opioid-free anesthesia

23AP03-5

Beyond a numeric index: is it enough to keep patients within the recommended Bispectral (BIS) Index?

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Background: Processed electroencephalogram (pEEG) monitoring is recommended to assess anesthesia depth during total intravenous anesthesia (TIVA). We present a geriatric case of delayed recovery and postoperative delirium (POD), whose BIS index was maintained within the recommended range.

Case Report: A 76-year-old female with coronary artery disease underwent thoracic decompression surgery for spinal mass; received standard monitoring with BIS. TIVA induction and maintenance were performed. The patient remained hemodynamically stable, BIS values were kept between 40–60, no intraoperative complication occured. 15 minutes after cessation of anesthetics, she responded to verbal stimuli and was extubated afterwards. Upon PACU transfer, she was disoriented. POD was diagnosed on day 1; which resolved 48 hours later with supportive therapy.

Discussion: Despite maintaining BIS in the 40s; burst suppression (BS) occurred, particularly and increasingly at values below 50, without hypotension (Figure 1).

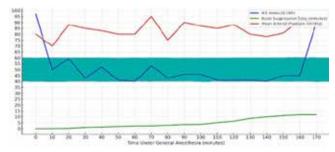


Figure 1.

Retrospective spectrogram analysis showed weak frontal alpha oscillations,a marker of vulnerable brain(1). Advanced age and coronary artery disease, known risk factors for increased burst suppression (BS)(2), heighten the risk of POD. Our case aligns with literature, as the patient developed POD under these conditions. Educating anesthesia providers to identify vulnerable brain physiology, prevent BS and reduce POD through individualized BIS

index and spectrogram-guided monitoring is essential, particularly for those relying solely on BIS values around 40 to remain "safe" and lacking in depth knowledge on spectrogram and raw EEG analysis.

References:

1. Shao YR et al.Low Frontal Alpha Power Is Associated With the Propensity for Burst Suppression: An Electroencephalogram Phenotype for a "Vulnerable Brain". Anesth Analg. 2020 2. Besch G et al. Occurrence of and risk factors for electroencephalogram burst suppression during propofolremifentanil anaesthesia. Br J Anaesth. 2011

Learning Points: BIS index values alone may not suffice in geriatric patients with vulnerable brain physiology. Incorporating raw EEG and spectrogram analysis into practice can mitigate complications in high-risk populations.

23AP03-6

Evaluation of the effect of preoperative iron deficiency anemia on Edmonton Frailty Score in geriatric patients planned for surgery undergoing colorectal cancer

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Background and Goal of Study: Frailty is a predictor of a patient's vulnerability to the stress of a surgical procedure and an increased risk of developing postoperative complications and postoperative adverse events.

Our primary hypothesis is that iron deficiency anemia (IDA) in geriatric patients increases the Edmonton Frailty Scale (EFS) score. Our secondary hypotheses are that a high frailty score increases the length of hospital stay, prolongs recovery time, and increases perioperative complications.

Materials and Methods: Our study included 120 patients over the age of 65 who were scheduled for elective laparoscopic colorectal cancer surgery. All of our patients were evaluated for anemia, and those with a hemoglobin value below 13 were considered anemic.

The patients were divided into 2 groups (anemic, non-anemic). All of our patients were subjected to the EFS during the preoperative evaluation. Heart rate, arterial blood pressure, and peripheral oxygen saturation were recorded at certain time intervals intraoperatively.

In addition; The duration of the operation, the need for inotropic agents, the amount of bleeding and blood transfusion, the duration of intensive care-hospitalization, the postoperative 15th minute Modified Aldrete Score and 30-day mortality were examined. Results and Discussion: In the examination conducted in two groups consisting of patients with and without IDA, it was determined that age (p=0.017), days of intensive care unit stay (p=0.01), total hospital stay days (p=0.016), EFS score (p<0.001) values were higher in patients with IDA.

There was a positive correlation with EFS (p<0.001) and a negative correlation with 15th minute Modified Aldrete Scores (p<0.001) in the duration of intensive care unit stay.

In the group with IDA and high frailty score, respiratory (p=0.047), cardiac (p=0.047) and neuropsychogenic (p=0.046) complications and inotropic agent use were higher (p<0.001).

Conclusion(s): In this prospective observational clinical study: we found that geriatric patients with IDA were associated with higher frailty scores. Perioperative difficulties are possible in geriatric patient group defined as fragile according to EFS.

23AP03-7

The role of vitamin C in postoperative recovery: reducing inflammation and pain after laparoscopic colon surgery in elderly patients - a randomized, double-blind, placebo-controlled trial

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Background and Goal of Study: Surgical intervention for colon cancer in elderly patients is often associated with significant inflammatory responses and postoperative pain. Vitamin C, an antioxidant with known anti-inflammatory properties, may offer a potential adjunct to improve postoperative outcomes.

This study aimed to evaluate the effect of intravenous vitamin C on inflammatory markers and postoperative pain in elderly patients undergoing laparoscopic surgery for colon cancer.

Materials and Methods: A total of 100 elderly patients (aged ≥65 years) scheduled for elective laparoscopic surgery for colon cancer were enrolled in a randomized, double-blind, placebocontrolled trial. Patients were randomly assigned to receive either 2 grams of intravenous vitamin C (Group A) or a placebo (Group B) before the surgical incision, with continued administration for 3 days postoperatively.

The primary outcome was the reduction in serum C-reactive protein (CRP) levels 24 hours post-surgery. Secondary outcomes included the assessment of postoperative pain using a numeric rating scale (NRS), opioid consumption, and the incidence of adverse effects such as hyperglycemia or wound infection.

The day before surgery, all patients were taught how to use the patient-controlled analgesia (PCA) system and how to rate pain intensity on the numeric rating scale, 0 indicating no pain and 10 representing the worst pain imaginable.

Results and Discussion: Group A demonstrated a significant reduction in CRP levels compared to Group B (P = 0.01), indicating a lower inflammatory response.

Additionally, postoperative pain scores were significantly lower in Group A at 6, 12, and 24 hours postoperatively (P = 0.02). Opioid consumption was also significantly reduced in Group A compared to Group B (P = 0.03).

There were no significant differences in the incidence of adverse effects between the groups, with no cases of hyperglycemia, fatigue, or wound infection noted in either group, reaffirming the safety of vitamin C in this context.

Conclusion(s): The results of this study underscore the potential of vitamin C as an adjunct in postoperative care. Intravenous administration of vitamin C was found to significantly reduce the

inflammatory response and postoperative pain in elderly patients undergoing laparoscopic surgery for colon cancer. This suggests that vitamin C could be a valuable addition to the postoperative care regimen for this patient population.

23AP03-8

Machine learning-based prediction of postoperative adverse outcomes in super-elderly patients undergoing non-cardiac surgery

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Background and Goal of Study:Super-elderly individuals are frail and vulnerable to adverse perioperative outcomes. Advancements in geriatric perioperative care allow these patients to undergo more extensive surgery, emphasizing the need for improved risk assessment. Machine learning (ML) has emerged as a powerful approach for individualized risk prediction using preoperative and intraoperative data. We aimed to evaluate ML-based prediction of postoperative complications in this population.

Materials and Methods: Data on super-elderly (≥85 years) surgical patients undergoing non-cardiac surgery at a single tertiary center were collected. ML models were trained using preoperative and intraoperative parameters to predict 30-day mortality as well as a composite of myocardial injury, renal injury, cerebrovascular accident, and 30-day mortality. Model performance was assessed using area under the receiver operating characteristic curves (AUROC). SHapley Additive exPlanations (SHAP) values were used to determine the contribution of variables. An interactive calculator was developed to visualize the models on simulated patients.



Results and Discussion: A total of 5,568 patients undergoing 7,048 surgical procedures were included (median [IQR] age 88 [86-91] years). Thirty-day mortality occurred in 523 cases (7.4%), and the composite outcome in 19.6%. For 30-day mortality, the ML model's AUROC was 0.774 (95% CI 0.738-0.811) when considering preoperative variables only and 0.793 (95% CI 0.759-0.827) when adding intraoperative variables. For the composite outcome. AUROC values were 0.771 (95% CI 0.748-0.794) for both models. SHAP analysis identified several key predictors including ASA physical status, emergency surgery, baseline creatinine, and hemoglobin.

Conclusion: ML models demonstrated moderate performance in predicting postoperative adverse outcomes in super-elderly patients, with limited to negligible contribution of intraoperative data to prediction.

Applying these models to larger datasets and additional perioperative risk factors may enhance accuracy. Interactive calculators could support clinical decision-making and allow individualized risk assessment.

23AP03-9

Factors contributing to increased hospital costs in older surgical patients after hip fracture

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Background: Our data (unpublished) indicate that surgical repair of hip fractures is associated with significantly higher hospital costs compared to non-operative treatment, likely due to lower mortality rates and longer hospital stays. Despite over 90% of hip fractures being managed surgically, the specific cost drivers remain unclear.

This study aimed to evaluate the impact of patient characteristics and perioperative factors on hospital costs in older adults undergoing hip fracture surgery.

Methods: This retrospective cohort study included patients aged 65 years or older who underwent primary fixation surgeries for fragility hip fractures at a metropolitan Australian hospital between July 2011 and July 2015. Demographic, perioperative, and cost data were extracted from electronic medical records and hospital administrative databases. A multiple regression model was employed to examine associations between total hospital costs and variables such as patient demographics, ASA scores, comorbidities, surgery type and timing, anaesthesia type, ICU admissions, blood transfusions, postoperative complications, and length of hospital stay (LOS).

Results: A total of 876 patients (73% female; mean age 84 ± 8 years) were included. The mean total hospital cost per patient was AU\$15,396 (95% CI: AU\$14,719-AU\$16,072), covering acute and subacute care until discharge.

On a per-patient basis, ICU admissions were the most expensive component, averaging AU\$5,491 per admission, followed by nursing care (AU\$4,411), medical care (AU\$4,190), and operating theatre costs (AU\$3,863).

The primary cost driver was LOS under acute care, as reflected by the greater beta coefficient (B = 0.609, p < .001). Other significant contributors included ICU admissions (B = 0.299, p < .001), total hip replacement (B = 0.217, p < .001), hemiarthroplasty (B = 0.105, p < .001), general anaesthesia (β = 0.064, p = 0.001), and blood transfusion (β = 0.058, p = 0.004).

Unlike previous studies, neither older age nor higher ASA scores significantly impacted costs.

Conclusions: Hospital costs for surgical management of hip fractures are primarily driven by perioperative factors, particularly acute LOS and ICU admissions, rather than baseline patient characteristics.

These findings highlight opportunities to optimize perioperative care and resource allocation to enhance cost efficiency. Further research is necessary to confirm these results and to address inconsistencies with prior studies.

23AP03-10

Evaluation of an 11-item questionnaire for self-assessment of sleep quality in elderly population

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Background and Aim: Perioperative sleep disturbances are common in surgical patients, often resulting from anxiety, biological stress, and the effects of anaesthetic drugs on the circadian cycle. These disturbances are linked to morbidity and postoperative complications, prompting investigations into their impact. Polysomnography, the gold standard for sleep quality assessment, is complex, expensive, and impractical for routine use outside intensive care settings. Consequently, many studies rely on questionnaires like the Pittsburgh Sleep Quality Index (PSQI), which assesses 24 items related to sleep characteristics and next-day somnolence. While PSQI evaluates average sleep over a month, it is increasingly used for repeated measurements in shorter timeframes pre- and post-surgery.

However, its complexity makes it challenging for elderly patients, particularly those with low education or cognitive impairments. To address this, we developed a shorter, simplified questionnaire based on PSQI.

Methods: The new 11-item questionnaire (SLEEP11) includes 10 binary and one categorical questions assessing sleep initiation, awakenings and their causes, snoring, bad dreams, medication use, next-day somnolence, and overall sleep quality. It was tested on 80 patients preoperatively, immediately postoperatively, and three months postoperatively. Patients also completed the PSQI as a reference questionnaire.

Results: SLEEP11 was easier to complete, with an average completion time of 43±11 seconds compared to 180±29 seconds for PSQI. Correlation analysis showed significant agreement between the two questionnaires across all time points (r>0.7, p<0.001) with Cronbach's a >0.8 signifying good internal consistency.

Conclusion: SLEEP11 is a promising tool for assessing perioperative sleep quality in elderly patients, offering simplicity and efficiency. It could be adopted as a standard screening and follow-up tool in perioperative care. Further validation studies are needed for complete validation of this tool.

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23AP03-11

Intraoperative hypotension and postoperative outcomes in super-elderly patients undergoing non-cardiac surgery

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Background and Goal of Study: Intraoperative hypotension (IOH) is strongly associated with postoperative morbidity and mortality, but this association has not been thoroughly investigated in super-elderly (age >85 years) surgical patients. Considering the growing rate of surgical procedures in this population, we aimed to test the association between various definitions of IOH in patients >85 years of age having noncardiac surgery and postoperative 30-day mortality as well as a composite of postoperative complications.

Materials and Methods: Perioperative data on super-elderly patients (≥85 years) undergoing non-cardiac surgery at a tertiary center between 2011 and 2024 were analyzed. Hypotension was primarily quantified as the area under a mean arterial pressure of 65 mmHg (AUC-MAP65), and secondarily as the time-weighted average MAP<65, and the lowest intraoperative MAP for 5 and 10 cumulative minutes. Area under the receiver operating characteristic curves (AUROC) analyses evaluated prediction of 30day mortality and a composite outcome of acute kidney injury, myocardial infarction, stroke, or mortality using each of the hypotension exposure variables. Optimal thresholds identified by Youden's J statistic were applied in Cox regression models to assess the association between hypotension and outcomes.

Results and Discussion: We analyzed data from 5,568 patients who underwent 7,048 surgeries, with a median age of 88 years (interquartile range [IQR]: 86-91 years). The median AUC-MAP65 was 35 (IQR 0-130) mmHg · min. Predictive accuracy for adverse outcomes was moderate (AUROC range: 0.602-0.612) across all IOH definitions. Survival analysis revealed a significant association between AUC-MAP65 and 30-day mortality (hazard ratio: 2.73; 95% CI: 2.29-3.25), which remained consistent and significant after adjusting for multiple demographic and perioperative confounders.

Conclusions: Individual markers of intraoperative hypotension showed limited predictive accuracy for adverse outcomes. However, survival analysis revealed a significant association between AUC-MAP65 and 30-day mortality, emphasizing its potential relevance in perioperative management. Consideration and management of preoperative risk factors may potentially play a larger role in determining these outcomes compared to the extent of intraoperative hypotension.

Critical Emergency Medicine

24AP01-1

Sweet suprise: unmasking euglycemic diabetic ketoacidosis

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Background: Euglycemic diabetic ketoacidosis (DKA) is a potentially life-threatening complication of taking dapagliflozin. It belongs to a class of sodium-glucose-linked transporter 2 (SGLT2) inhibitors. It is characterised by euglycemia (blood glucose levels < 250 mg/dL/13.9 mmol/L), ketonemia and metabolic acidosis (pH< 7.3, serum bicarbonate< 18 mmol/L).

Case report: A 66-year-old male was admitted for elective surgery for lung squamous cell carcinoma. He was treating arterial hypertension and DM ty 2.He was also recently diagnosed with squamous cell carcinoma of the larynx (with hoarseness as the primary symptom).

After the surgery, he was stable and was transferred to a department room. Chronic therapy was continued, including dapagliflozin in combination with metformin. On the 3rd postoperative day, he started feeling nauseous, extraordinarily thirsty and with a slight chest pain. His breathing was fast and consistent (indicative of Kussmaul's breathing).

Considering he suffered an acute myocardial infarction 12 years ago, we ruled out an ACS as well as PE. Blood results showed a pH level of 7.05, arterial partial pressure of carbon dioxide (PaCO2) of 1.95 kPa, arterial partial pressure of oxygen (PaO2) of 18.6 kPa, serum glucose levels of 11.5 mmol/L and bicarbonate levels of 7.4 mmol/L.Lactates were normal, and the anion gap was very high (29 mmol/L).

He was intubated by an RSI protocol and transferred to the ICU. He was treated with intravenous crystalloid infusion of 0,9% sodium chloride and 10% glucose solution with continuous insulin infusion. His arterial blood gas (ABG) tests showed a fast improvement.

He was mechanically ventilated for a day, successfully weaned from the respirator, and extubated on the 2nd day. His ABG after extubation showed a pH of 7.43, PaCO2 of 5.51 kPa, PaO2 of 24.5 kPa,a glucose level of 9.8 mmol/L,and bicarbonate level of 27.4 mmol/L.

Discussion: SGLT2 inhibitors should be stopped three to four days before surgery, and we wanted to point out the necessity of that time window.

In this case, the recommended pause in taking dapagliflozin was not done, and it possibly led to the development of eDKA as a severe complication.

Surgery itself is a risk factor for developing an eDKA in patients who are taking SGLT2 inhibitors as it raises cortisol levels and contributes to the cascade leading to ketogenesis. It can also lead to hypovolemia and possible urinary tract infections (UTI), the latter especially linked with dapagliflozin.

24AP01-3

Evaluation of catheter-associated urinary tract infection between latex urinary catheter and metal alloy coated urinary catheter in critically ill patients

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Background and Goal of Study: Catheter-associated urinary tract infection (CAUTI) accounts for 9% of hospital-acquired infection (HAI)1.

This study assessed the incidence of CAUTI between two different types of urinary catheter, the latex urinary catheter and the latex coated metal alloy urinary catheter, used in the intensive care unit (ICU) setting.

Materials and Methods: This was a randomized, prospective, single-blinded study involving 76 ICU patients requiring catheterization and admission for more than 48 hours in ICU. Patients were allocated to the metal alloy catheter group and latex catheter group, with a randomization ratio of 1:1. CAUTI incidence was conducted at study entry, after 48 hours in ICU, day 7 in ICU or any signs or symptoms of CAUTI detected within ICU stay.

For statistical analysis, categorical data were compared using the chi-square or Fischer Exact test, and clinical outcomes were compared using t test.

Results and Discussion: A total of 70 patients were recruited. The majority of admissions to the ICU were due to HAI. Overall the mean age was 48.6 ± 19.2 years old with majority of them being male (61.4%).

The mean APACHE II scores between the latex and metal alloy were 14.20 \pm 4.22 and 12.34 \pm 3.76 respectively. The mean for SOFA scores between the latex and metal alloy cathter were 6.71 \pm 1.93 and 5.57 \pm 1.96 respectively.

The mean ICU length of stay between the latex and metal alloy was 6.20 ± 1.5 and 5.74 ± 1.58 respectively. The mean catheterization days between the latex and metal alloy catheter group were 6.00 ± 1.52 days and 5.74 ± 1.58 .

There was 1 incidence of CAUTI which was only seen in the latex catheter group, and no incidence of CAUTI in the metal alloy group.

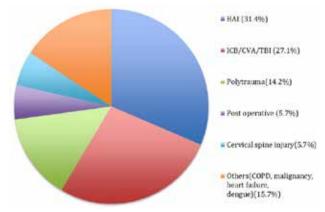


Figure. Diagnosis on admission.

Conclusion(s): In conclusion, there is no statistical difference in the incidence of CAUTI between the latex urinary catheter and the metal alloy urinary catheter group for short-term catheterization in critically-ill patients.

References:

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24AP01-4

The first China Malignant hyperthermia database based on national remote emergency system for malignant hyperthermia

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Background and Objectives: Currently, there is no malignant hyperthermia (MH) database in China. This study establishes the first MH database in China using our developed National Remote Emergency System for MH (MH-NRES).

Methods: The MH clinical database comprises 8 functional modules: patient demographics, clinical information, surgical and anesthesia-related information, treatment, medical history, genetic test, and family history. As of August 30, 2024, a total of 48 patients have been enrolled in this database.

Results: Among the 48 MH patients, 39.6% are under 18 years old and 45.8% are between 18 and 50 years old. The male-tofemale ratio is 5:1. All patients were administered volatile anesthetics, and one patient received succinylcholine.

The overall mortality among the 48 MH patients was 41.6%. With the increasing use of dantrolene over the years, a decreasing trend in patient mortality was observed.

Genetic sequencing of 22 patients disclosed 19 MH mutations, consisting of 17 variants in RYR1 and 2 in CACNA1S. Among of these, 4 newly discovered variants were detected in RYR1 gene (c.12587T>C, c.5194G>A, c.10670T>C, and c.5011_5015delinsAC) and 2 in CACNA1S gene (c.3853G>T, c.4392T>A).

Conclusion: This study establishes the first MH clinical database in China, enabling the analysis of epidemiological, clinical manifestations, and outcomes of MH in China. Integration of clinical and genetic data provides high-quality evidence for optimizing MH perioperative management.

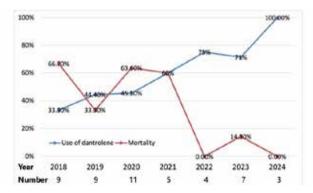


Fig 1. Association betwen dantrolene use and mortality from 2018 to 2024.

24AP01-5

The impact of a restrictive oxygen strategy versus a liberal oxygen strategy on health-related quality of life after trauma - a follow-up study on the TRAUMOX2 trial

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Background and Goal of Study: Liberal supplemental oxygen is recommended in the acute treatment of severely injured trauma patients, but guidelines lack recommendations on an upper limit and duration of the treatment. The evidence on the use of supplemental oxygen for trauma patients is limited and certainty of evidence is low to very low. The international, multicentre, controlled trial, TRAUMOX2, randomised adult trauma patients to receive either a restrictive oxygen strategy or a liberal oxygen

Case	1/4/5	2	3/11	6/20	7/8	9	10	12/18	
Nucleotide change	c.7361G>A	c.14512C>G	c.7354C>T	c.7522C>G	c.7042_7044del	c.1597C>T	c.7523G>A	c.12587T>C	
Amino acid change	p.Arg2454His	p.Leu4838Val	p.Arg2452Trp	p.Arg2508Cys	p.Glu2348del	p.Arg533Cys	p.Arg2508His	p.lle4196Thr	
dbSNP	rs118192122	rs193922878	rs118192124	rs118192178	rs121918596	rs193922768	rs193922818	-	
CGS	43/58/38	58	48/45	63	52/55	68	53	46/55	
Case	13	14	15	16	17	18	19	21	22
Nucleotide change	c.5194G>A	c.12700G>C/ c.10670T>C	c.496G>A	c.14817C>A	c.14809A>G	c.6313T>C	c.5011_5015 delinsAC	c.677T>A	c.3853G>T/ c.4392T>A
Amino acid change	p.Glu1732Lys	p.Val4234Leu/ p.Leu3557Pro	p.Asp166Asn	p.Asp4939Glu	p.lle4937Val	p.Trp2105Arg	p.Ala1671_Val 1672delinsThr	p.Met226L ys	p.Gly1285 Cys/ p.Asn1464 Lys
dbSNP	-	rs193922852/-	rs193922755	rs193922895	rs2145917369	rs1233527315	-	rs112596687	-/-
CGS	53	73	78	58/46	63	75	55	63	61

CGS, clinical grading scale; dbSNP, the single nucleotide polymorphism database. Two CACNA1S variants were found in the patient No.22, and 17 RYR1 variants were detected in the other 21 patients.

strategy for the first eight hours after injury and assessed 30day mortality and major respiratory complications within 30 days

This study aimed to assess health-related quality of life of TRAU-MOX2 participants at six and 12 months after trauma. We hypothesised that the restrictive oxygen group would have a better selfrated health by 12-month follow-up.

Materials and Methods: A total of 1508 participants completed the TRAUMOX2 trial and were eligible to participate in this followup study. Participants were contacted by telephone at six and 12 months after trauma. Health-related quality of life was assessed with the EQ-5D-5L questionnaire. This covers five domains: mobility, self-care, usual activities, pain or discomfort, and anxiety or depression.

Further, the questionnaire assesses the participants' self-rated overall health evaluated with the EQ-VAS ranging from 0 (the worst imaginable health) to 100 (the best imaginable health). The last participant was contacted for follow-up in October 2024.

The primary outcome was EQ-5D VAS score at 12 months after trauma and the primary analysis was an intention-to-treat analysis. The EQ-5D VAS scores were compared between the two groups using multivariable linear regression adjusted for the stratification variables site of inclusion and endotracheal intubation status at randomisation. Results were reported as mean difference with corresponding 95% CIs.

Results and Discussion: Results will be available at the time of presentation.

Conclusion: This study will provide evidence on the long-term effects of a restrictive oxygen strategy versus a liberal oxygen strategy for the first eight hours after trauma on health-related quality of life.

24AP01-6

Continuous electrocardiograph and plethysmography dataset for the prognostic prediction in critically ill patients

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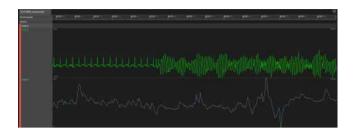
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Background and Goal of Study: Continuous 3-lead ECG is essential for cardiac monitoring in the ICU, while PPG offers portability for tracking cardiac features. Advances in machine learning have facilitated arrhythmia and outcome prediction but are constrained by lack of high-quality clinical datasets.

This study aims to address this gap by creating a comprehensive dataset of continuous ECG and PPG waveforms with precise cardiac arrest event labeling.

Materials and Methods: This study was approved by the Institutional Review Board and Data Review Board with international release after confirming proper anonymization. Patients admitted to the surgical and medical ICUs at Seoul National University Hospital (SNUH) between Oct 2019 and Dec 2023 with ICU stays over 48 hours were included.

The dataset includes a CSV file with patient demographics and outcomes(cardiac arrest, mortality, discharge), and waveforms of lead II ECG and PPG. Waveforms span 48 hours before and 1 hour after the event time. Clinical outcomes were extensively reviewed, with only the first event recorded. Waveforms were collected using patient monitors, stored using VitalRecorder, and saved and provided as vital file (Figure 1). Clinical data were categorized, and vital file timestamps were anonymized relative to the event time, standardized as 2100-01-01 00:00.



Results and Discussion: 4,737 continuous ECG and 3,832 corresponding PPG waveforms were included. Among these, 378 cases (8.0%) resulted in death, and cardiac arrest occurred in 77 cases (1.6%). The median age was 65 [55-75] years with 60.0% being male. The median ICU stay duration was 70.0 [36.9-149.0] hours.

Conclusion(s): We have developed a novel dataset of continuous ECG and PPG waveforms with precise cardiac arrest event labeling. This dataset addresses the limitations of existing cardiac waveform resources and offers significant potential for advancing prognostic algorithms and wearable technologies for critically ill patients.

Acknowledgements: This dataset is freely available via the National Strategic Technology Research Institute(https://nstri.net) platform of SNUH for users who consent to the data use agree-

24AP01-7

Prehospital triage of pediatric emergencies treated by helicopter emergency medical services

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Background and Study Goal: Helicopter Emergency Medical Services (HEMS) are part of Emergency Medical Services in many countries. In Denmark, HEMS are staffed by anesthesiologists trained in prehospital emergency medicine and mainly respond to severe trauma and urgent emergencies. Upon assessment, HEMS clinicians triage patients to tertiary or local hospital emergency departments (EDs), prioritizing critically ill or injured patients for tertiary EDs.

We aimed to evaluate the impact of HEMS triage decisions for pediatric patients by comparing 30-day mortality in those triaged to tertiary versus local EDs, hypothesizing higher mortality and more critically ill patients in the tertiary ED group.

Materials and Methods: We conducted a registry-based cohort study including patients aged <18 years treated or examined by a Danish HEMS crew between September 1, 2019, and August 31, 2024. We excluded interhospital transfers, patients without valid civil registry numbers, and those pronounced dead or treated/released at the scene.

The primary outcome was 30-day mortality. Secondary outcomes were National Advisory Committee on Aeronautics (NACA) scores, ICD-10 diagnoses, and prehospital interventions.

Results and Discussion: We identified 1.113 helicopter missions registered during this period. Of these, 836 patients were included in the analyses. 30-day mortality was significantly higher in the tertiary ED group with 32 patients (5.4%) compared to one patient in the local ED group (0.4%; Fisher's exact test, P<.001). The only local ED patient who died suffered cardiac arrest: the

HEMS clinician opted for ambulance transport to the nearest ED for a short critical procedure and likely treatment termination, prioritizing speed over a longer helicopter transfer. Patients triaged to tertiary EDs had higher NACA scores and underwent more prehospital interventions.

Among tertiary ED patients, the most common ICD-10 diagnosis group was Injuries and Poisoning, while for local ED patients, it was Other factors influencing health status. Pediatric triage may pose a challenge for HEMS clinicians.

However, our findings support our hypothesis, indicating that the most critically ill pediatric patients are generally identified correctly by HEMS clinicians and triaged to higher-level treatment

Conclusion: 30-day mortality was higher in patients triaged to tertiary EDs, possibly reflecting appropriate triage of critically ill or injured pediatric patients by HEMS clinicians.

24AP01-8

Corticosteroid prophylaxis decreases the incidence of fat embolism syndrome in lower extremity fractures

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Background and Goal of Study: Fat embolism syndrome (FES) is a relatively infrequent, yet potentially life-threatening complication associated with long bone fractures [1], exhibiting an incidence of approximately 2-5% [2,3].

This study investigates the utilization of corticosteroids as a prophylactic measure to reduce the occurrence of FES in such cases.

Materials and Methods: A retrospective, single-center study was conducted at the Trauma University Hospital in Tirana, Albania, spanning from January 2011 to January 2012. The study encompassed a cohort of 232 patients diagnosed with fractures of the lower extremities. The primary goal was to evaluate the prophylactic role of corticosteroids, specifically methylprednisolone at a dosage of 10mg/kg, in the development of fat embolism syndrome (FES). Patients were dichotomized into two groups: Group 1, consisting of 116 patients administered corticosteroid prophylaxis, and Group 2, encompassing 116 patients without corticosteroid prophylaxis for FES.

Results and Discussion: Within Group 1, the incidence of FES was recorded at 2.58%, with an absence of severe respiratory manifestations. In contrast, Group 2 exhibited an FES incidence of 11.20%, out of which 6.03% necessitated intensive care unit (ICU) respiratory support. The prevalence of FES was significantly lower in Group 1, subjected to corticosteroid prophylaxis. in comparison to Group 2, where no such prophylaxis was administered (p < 0.05). Group 2 patients also displayed heightened instances of pulmonary complications.

Conclusion(s): The administration of corticosteroid prophylaxis in cases of lower extremity fractures was correlated with a notable reduction in FES incidence. Furthermore, this intervention demonstrated its merit by effectively attenuating pulmonary complications associated with FES.

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24AP01-9

Anaesthetic challenges in a patient with penetrating cervical trauma: a multidisciplinary success

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Background: Penetrating cervical trauma presents significant challenges due to the complex anatomy and high risk of injury to vital structures. A multidisciplinary and well-coordinated approach is essential for achieving optimal patient outcomes.

Case report: A 54-year-old male sustained a cervical impalement injury following a 2-meter fall. On arrival at the emergency department, he had a patent airway, cervical subcutaneous emphysema, and was hemodynamically stable with no active bleeding. CT imaging (fig. 1) revealed the metallic object's trajectory: entry at the cricoid cartilage level, descending between the trachea and the common carotid artery.

In the operating room, general anesthesia was induced with careful hemodynamic management and standard monitoring, complemented by cerebral oximetry (NIRS). The airway was secured using videolaryngoscopy, with an otolaryngologist (ENT) specialist on standby for potential surgical airway management.

Esophagogastroduodenoscopy excluded esophageal perforation. Angiography was performed, and an intra-aortic balloon was placed ready for inflation if required, prior to cervicotomy and foreign body removal. Considering the risk of postoperative airway compromise from cervical edema and hematoma, the patient remained intubated for 24 hours.

Discussion: The successful management of this case highlights the critical importance of interprofessional teamwork, thorough planning, and anticipation of potential complications. Coordination among anaesthesiology, general surgery, vascular surgery, ENT, and gastroenterology was key. The strategy prioritized the prevention of respiratory compromise and injury to vital structures, demonstrating the value of a multidisciplinary approach.



Fig. 1

References:

Hyub Huh et al. Anesthetic management of penetrating neck injury patient with embedded knife - A case report. Korean J Anesthesiol. 2012;62(2):172-174.

Learning points: Comprehensive planning, interprofessional collaboration, and the anticipation of complications are pivotal in managing penetrating cervical trauma. The use of a multidisciplinary approach ensures enhanced patient safety and outcomes.

24AP01-10

Anesthesiology and critical care on warships: **Experience in the Spanish Navy (1999-2025)**

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Background and Goal of Study: Medical care in naval environment is based on a stepped treatment that goes from level 1 (physician, nurse and paramedic on-board) to level 4 (hospital in national territory). The major surgical capacity on board is from level 2. Spanish naval medicine has participated in humanitarian support, armed conflicts, fight against piracy and training cruises in the last quarter of century.

The objective of this study is to analyze type anesthesia performed on board Spanish Navy warships by military anesthesiologists in the last 25 years (1999-2024).

Materials and Methods: Retrospective and descriptive study about anesthesiological support performed in Spanish navy warships with Role 2 capacity from 1999 to 2024. The dichotomous variables are included: general anesthesia and regional anesthesia, and the following polytomous variables: name of the ship, international operation, type of injury or illness that generated the need for anesthesia, type of regional anesthesia (intradural, epidural, peripheral nerve - interscalene, axillary, median, femoral, popliteus). To obtain this information, the final mission reports and related scientific publications are analyzed and semi-structured interviews are conducted with anesthesiologists who were on board during the operations that are the subject of this study. The confidentiality of the data obtained is maintained, preserving the information on a computer with an access code. Authorization is obtained from the HCDGU ethics committee (67/18 amendment 1).

Results and Discussion: During the study period, a total of 100 anesthetic techniques have been performed on Spanish navy warships. 72 have been general anesthesia, while the remaining 28 have been regional anesthesia (15 intradural, 6 epidural, 7 brachial plexus blocks). 41 techniques were carried out in humanitarian support (hurricane, tsunami or earthquakes), 36 in the Iraq war, 18 in the fight against piracy and 5 on training cruises. One patient suffered aspiration during anesthesia induction.

Conclusion(s): General and regional anesthesia has been carried out on Spanish Navy ships in humanitarian missions, naval deployments in combat zones, anti-piracy navigations and training cruises.

Reference:

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Acknowledgements: Spanish Navy

24AP01-11

A comparative study of two chest compression methods using a manneguin in infant cardiopulmonary resuscitation: the two-finger method versus the thumb-index finger method

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Background and Goal of Study: Chest compressions using the two-finger method, currently considered the standard for infant CPR by a single rescuer, tend to be weak and tiring. Therefore, the two-finger and thumb-index finger methods were compared to determine whether the latter could become the new standard. Materials and Methods: This prospective crossover comparative study evaluated the effectiveness of two infant CPR chest compression methods - the standard two-finger method and the thumb-index finger method developed by Zeynalov et al. - using a Resusci Baby QCPR® manikin. Nurses without physical limitations participated, excluding pregnant women. Each subject performed 5 CPR cycles (30 compressions:2 ventilations) for 2 minutes per method, synchronized to a 112 bpm metronome, with an 8-second pause for artificial respiration. Compression depth, position, tempo, release, and uninterrupted compression time were analyzed. A Visual Analog Scale questionnaire assessed ease, fatigue, effectiveness, and preference. Statistical analysis used paired t-tests (p<0.05).

Results and Discussion: A total of 27 subjects, all female, were included in the study. While both methods showed similar scores for compression rate, position, and interruption time, the thumbindex finger method demonstrated significantly greater compression depth (42.2 \pm 1.7 mm vs. 40.0 \pm 2.5 mm) and depth score (95.1% vs. 77.2%, p<0.01). However, the two-finger method had a higher pressure release score (p<0.05). The thumb-index finger method was preferred by participants, who found it less tiring, easier to use, and more effective. Limitations include a short observation period, mannequin-based simulation, and unfamiliarity with the thumb-index finger method, which may have affected the release scores. Longer studies and additional training may further validate these findings.





Figure. Standard "Two-Finger Method" and the "Thumb-Index Finger Method".

Conclusion(s): The thumb-index finger method for single-rescuer infant CPR offers better compression depth and causes less fatigue than the two-finger method, suggesting its potential to become the standard chest compression technique.

Reference:

Zeynalov BF, et al. J Med Dent Sci 2011;58:15-22

24AP01-12 Blast Grenade explosion in hand: an anesthesiology approach beyond pain control

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Background: Anesthesia role should be redefined, specially regarding the benefits of regional blockade. The brachial plexus block not only aids in pain management but can improve healing and modulates the inflammatory response to trauma. Employing a perineural catheter prolongs the positive effects during the recovery of devitalized tissues following high-intensity trauma.

Case Report: 44 year old male, p1, victim of a grenade explosion in his right hand during work. He arrived in the OR alert but in hypovolemic shock. General anesthesia and a brachial plexus block approach were initiated. The surgical team initially proposed amputation of the hole hand. Due to the patient's youth and economically active, they decided to amputate 4th and 5th limbs, opting for surgical reconstruction of 1st, 2nd, and 3rd digits preserving pinch movement.

At the end, a perineural catheter was placed in the infraclavicular region. The anesthesiology team conducted follow-ups, monitoring capillary refill time, healing and pain management. Infusions of a local anesthetic and corticosteroid were administered through the catheter g12, alongside 2g of IV ascorbic acid daily. Seven days post trauma the catheter was removed and he was discharged. Five months later he maintain skin integrity, sensitivity and complete mobility of the remaining fingers, with pincer movement.

Discussion: Microvascular changes induced by the anesthetic block enhanced tissue oxygenation, increased local temperature, improved nutrient supply, accelerated healing, optimized motor rehabilitation, reduced opioid consumption and shorter hospital stay.

Reference: British Journal of Anaesthesia 106 (6): 887–95 (2011) Advance Access publication 6 April 201.doi:10.1093/bja/aer085

Learning points: regional anesthesia reducing inflammatory response; regional anesthesia regaining motor function; pain control management





Metronome use enhances the maintenance of a target compression pace in a manikin model of cardiopulmonary resuscitation - new directions

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Background and Goal of Study: Our university group has been exploring the influence of a metronome on the quality of chest compressions in the educational environment. Using the device could significantly enhance the effectiveness of CPR training, potentially leading to improved patient outcomes in real-life emergencies.

Materials and Methods: We used a manikin model and collected data from medical students during CPR classes. After a thorough one-hour training, the students were randomly assigned to two groups: no metronome (NM) and metronome at 110 (M110). Each student performed three cycles of 30 compressions, alternating with a second student and then returning to the first student, completing nine cycles.

The authors meticulously recorded the frequency and depth of the compressions using LLEAP® simulation software and analyzed the data with the image processing program Image-J®).

Results and Discussion: Our investigation encompassed 13,230 compressions from 441 cycles involving 98 students. One hundred forty-four cycles (32.65%) had means out of the recommended range (100-120), with fewer cases in M110 (p=0.009).

Most out-of-range cycles were above 120 CPM. Survival analysis showed a difference between the groups across time, considering the failure criteria if surpassing 120 CPM (p=0.026, Figure 1).

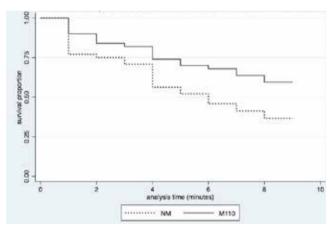


Figure 1. Kaplan-Meier survival estimates for CR> 120 CPM.

The students who repeated the three cycles did not decrease the depth compressions using or not the metronome in the last three cycles (p=0.06). Adopting the CPR board under the manikin increased the overall mean depth compared to another study in the previous semester, in the same conditions, from 37.17 ± 7.77 to 40.54 ± 7.2 , p=0.0009.

Conclusion(s): Our study's results have substantial implications for using metronomes in CPR training. The overall compression depth was below the recommendations for an emergency setting, but the instrument's frequency is a reliable quide to keep students within the correct rate range. Using a CPR board effectively increases the compression depths.

Reference:

Çaliskan D, Bildik F, Aslaner MA, et al. Effects of metronome use on cardiopulmonary resuscitation quality. Turk J Emerg Med. 2021 Feb 12; 21(2): 51-55.

24AP02-2

Not every confusional syndrome is a delirium: beware of the dangerous simulator, the stroke

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Background: Endovascular treatment of thoracic aortic aneurysm (TEVAR) has revolutionized the management of this pathology by offering a less invasive alternative to open surgery. However, this procedure is not free of complications, among which ischemic stroke represents one of the most serious and might be confused with delirium.

Case Report: A 75-year-old man was admitted to the surgical ICU after endovascular placement of a fenestrated endoprosthesis in the aortic arch and dissecting stent in the descending aorta as treatment for descending aortic aneurysm.

The procedure lasted 8 hours. Upon arrival, the patient presented significant agitation that prevented neurological examination, reauiring neuroleptics.

After the agitation improved, we examined the patient, drawing attention to a left oculocephalic deviation and mild dysarthria, so we activated the ICTUS code. CT was performed showing established ischemic infarction of the left PICA, not susceptible to revascularization, so antiplatelet therapy was started.

Three days later the patient started with weakness in MMII, and MRI was performed, leading to the diagnosis of spinal ischemia.

Discussion: Acute confusional syndrome is a very common entity in elderly post-surgical patients. However, it is important to perform a differential diagnosis with other possible causes of cognitive impairment, especially in the context of surgeries that can release thrombi into the cerebral circulation, as in this case.

The incidence of stroke after TEVAR is 2.7% and in the case of our patient it probably occurred during surgery. Therefore, not only is the neurological examination important when waking up, but also the monitoring of cerebral oximetry and BIS during the procedure, which in this case was not performed.

Another complication of this surgery is spinal cord ischemia, with an incidence of 2.2%, which our patient also developed.

Reference:

Buth J et al Neurologic complications associated with endovascular repair of thoracic aortic pathology. EUROSTAR Registry. J VascSurg. 2007Dec;46(6):1103-1111.

Learning Points: Not all postoperative agitation is acute confusional syndrome. It is important to perform a good neurological examination of our patients, always keeping in mind the complications inherent to each type of surgery.

In surgeries that can release thrombi into the CNS, cerebral oximetry and BIS should be monitored, since although they are not diagnostic monitors, they can warn us that something is not right.

Optimal prehospital blood pressure thresholds in patients with severe traumatic brain injury – A BRAIN-PROTECT study

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Background and Goal of Study: Severe traumatic brain injury (TBI) is a leading cause of mortality and morbidity among young adults. In the prehospital setting a primary treatment focus is the prevention of secondary brain injury. A key component of this management is maintaining an appropriate cerebral perfusion pressure (CPP), and hence, systemic blood pressure.

However, the optimal blood pressure threshold remains a topic of ongoing debate. Current guidelines recommend a minimum systolic blood pressure (SBP) of 110 mmHg, based on level III evidence. For patients aged 49 to 70 years, the recommended minimum SBP is 100 mmHg. We aimed to identify the blood pressure threshold that is associated with the lowest mortality

Materials and Methods: The BRAIN-PROTECT study is an observational multicentre study that included patients with severe traumatic brain injury, treated by Dutch Helicopter Emergency Medical Services between February 2012 and December 2017. Patients were followed for one year after inclusion.

Blood pressure measurements were recorded at multiple time points during prehospital treatment. The association between blood pressure and 30-day mortality was analysed using multivariable logistic regression.

Results and Discussion: A total of 1,814 patients were included in the analysis. A U-shaped relationship was observed between systolic blood pressure (SBP) and the probability of 30-day mortality (p<0.001). The lowest mortality probability occurred in patients with an SBP between 110 mmHg and 140 mmHg, with increased mortality observed at both lower and higher SBP values.

When categorizing the lowest recorded prehospital SBP, patients with an SBP \leq 90 mmHg had an odds ratio (OR) of 2.22 [95% CI: 1.85–2.65] for mortality compared to the reference category (110–150 mmHg). For those with an SBP of 90–110 mmHg, the OR was 1.07 [95% CI: 0.92–1.24], while patients with an SBP >150 mmHg had an OR of 1.90 [95% CI: 1.60–2.25] compared to the reference category.

Subgroup analysis of patients with isolated traumatic brain injury (TBI) showed an increased OR of 3.78 [95% CI: 2.67–5.32] for those with an SBP \leq 90 mmHg and an OR of 2.23 [95% CI: 1.78–2.79] for those with an SBP >150 mmHg.

Conclusion(s): In this observational cohort of patients with suspected severe TBI it shows that an SBP <90 mmHg and >150 mmHg is associated with increased mortality in both multi-trauma and isolated neurotrauma.

The optimal SBP range appears to be 110–150 mmHg, emphasizing the importance of targeted blood pressure management in severe TBI.

24AP02-4

Prehospital prevalence of severe hypotension in TBI patients

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Background and Goal of Study: Hypotension (systolic BP < 90 mmHg) is an independent predictor of poor outcomes in traumatic brain injury (TBI). Effective prehospital management of hypotension is critical to reducing secondary brain injury.

This study quantifies the prevalence of severe hypotension in TBI patients in the prehospital environment using BP on hospital arrival as a surrogate for prehospital hypotension and identifies high-risk groups to guide future research into targeted prevention and treatment strategies.

Materials and Methods: This retrospective analysis used data from the ADAC-Luftrettung electronic mission logs (2017–2021), including 22,028 TBI patients. Injury severity was classified in line with the German Trauma Registry into isolated TBI, multiple injuries, and polytrauma. TBI severity was categorized by Glasgow Coma Scale (GCS) into mild (GCS 13–15), moderate (GCS 9–12), and severe (GCS 3–8). Statistical analyses assessed correlations between hypotension prevalence, TBI severity, and injury patterns.

Results and Discussion: Among severe TBI patients, hypotension on hospital arrival was observed in 6.9% of isolated TBI, 5.0% of those with multiple injuries, and 18.5% of polytrauma cases. Moderate TBI patients showed hypotension rates of 1.5% (isolated), 1.4% (multiple injuries), and 6.8% (polytrauma). For mild TBI, hypotension prevalence was 0.4% (isolated), 0.3% (multiple injuries), and 3.1% (polytrauma). A significant positive correlation was found between TBI severity and hypotension prevalence (Spearman Rank ρ = 1, ρ = 0.0). Polytrauma was consistently associated with higher rates of hypotension across all TBI severities (Table 1).

	Isolated	TBI &	TBI &
	TBI	Multiple Injuries	Polytrauma
Severe TBI (GCS 3-8); N	1290	821	2160
BP<90mmHg on hospital arrival; N (%)	89 (6.9%)	41 (5.0%)	400 (18.5%)
Moderate TBI (GCS 9-12); N	652	564	704
BP<90mmHg on hospital arrival; N (%)	10 (1.5%)	8 (1.4%)	48 (6.8%)
Mild TBI (GCS13-15); N	4388	8563	2886
BP<90mmHg on hospital arrival; N (%)	19 (0.4%)	33 (0.3%)	89 (3.1%)

Table 1.

Conclusion(s): This study identifies severe TBI patients with polytrauma as the highest-risk group for prehospital hypotension, emphasizing the need for aggressive prehospital blood pressure management, including vasopressor administration and prehospital blood transfusions. Future research should focus on tailored strategies for high-risk groups to reduce hypotension and improve outcomes.

Cardiac arrest due to massive carbon dioxide embolism during laparoscopic surgery: a case

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Background: Clinical presentation of carbon dioxide (CO_a) embolism ranges from asymptomatic to cardiovascular collapse or even death. Clinically evident CO₂ gas embolism is rare. Transesophageal echocardiogram (TEE) is the most sensitive method for diagnosis of massive gas embolism.

Case Report: A 73-year-old woman with history of left renal invasive urothelial carcinoma with left renal vein tumor thrombus. The induction of anesthesia was smooth. An arterial line and a central venous catheter was placed.

About 75 minutes into the procedure, during surgical approach to the renal vessels and kidney, accidental tear in the inferior vena cava (IVC) was reported. Massive bleeding occurred, prompting urgent blood transfusion. The surgeon attempted laparoscopic repair and hemostasis of the torn IVC.

However, she developed significant bradycardia and hypotension. Systolic arterial pressure decreased from 140 to 40 mmHg. Sudden decrease in EtCO₂ and cardiac arrest were found. She was quickly repositioned to Trendelenburg position and cardiopulmonary resuscitation was initiated. Emergent TEE showed air bubbles in all four chambers. Massive CO, embolism was diag-

Forty minutes post-arrest, V-A ECMO was initiated due to persistent PEA. Emergent laparotomy was performed to actively control bleeding. Operation using an open approach and the IVC defect was repaired by cardiovascular surgeon.



Discussion: Clinical presentation of CO₂ embolism ranges from asymptomatic to neurologic injury, cardiovascular collapse or even death, which is dependent on the rate and volume of CO₂ entrapment and the patient's condition.

In our case, the etiology of bubbles might be entering the vessel via the tear on IVC. In such situations, immediate notification to the surgical team is vital for patient safety.

Reference:

Kim et al. Cardiac arrest associated with carbon dioxide gas embolism during laparoscopic surgery for colorectal cancer and liver metastasis - A case report. Korean J Anesthesiol. (2012)

Learning points: Our case highlights the critical importance of prompt diagnosis and treatment in the event of a massive carbon dioxide embolism during laparoscopic surgery.

24AP02-6

An atypical case of acute liver failure caused by hypovolemic shock

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Background: We present the case of a 26-year-old woman who was conducted to the hospital with severe hyperpyrexia and acute altered mental status. She had a pre-existing psychiatric disorder and intellectual disability, on chronic psychotropic medication. From an initial condition of hypovolemic shock probably caused by heat stroke or neuroleptic malignant syndrome, her condition rapidly progressed to fulminant liver failure, necessitating an urgent hepatic transplantation. This conditions are infrequently and difficult to diagnose but can still be associated with serious consequences.

Case Report: Before urgent hospital admission, the patient was in good health on regular follow-up and well-controlled on medications. During outdoor activities in the summer, she acutely developed altered behavior that rapidly progressed to coma, accompanied by marked hyperpyrexia and cardiovascular instability.

Upon admission, she required invasive mechanical ventilation and vasopressors. Initial investigations revealed acute kidney injury, elevated AST/ALT, myoglobin, troponin, and CK, with negative inflammatory markers and toxicology screen.

A persistent coma was initially associated with a non-ST-elevation myocardial infarction and a positive fecal test for toxigenic Clostridium Difficile, which was treated with antibiotics. On the second day of admission, she developed acute liver failure, leading to urgent liver transplant with a successful outcome.

Discussion: The differential diagnosis included neuroleptic malignant syndrome or heat stroke, possibly exacerbated by a toxigenic Clostridium Difficile infection. The absence of frank muscle rigidity and moderately elevated CK levels seemed to favor heat stroke, but differentiating between these two conditions is challenging due to their rare prevalence, overlapping clinical presentations and the lack of specific diagnostic tests.

Management is similar for both conditions. Initial severity scores (SOFA 13, SAPS II 80, APACHE II 26) predicted a high mortality rate. Evidence suggests that ischemic hepatitis is a common consequence of hypovolemic shock, particularly in young, healthy patients with limited treatments if the condition does not respond to supportive care.

Conclusions: This case highlights the diagnostic challenges posed by rare clinical conditions that lack specific diagnostic tests or treatments. Early consultation with a specialized center allowed for timely liver transplantation and patient survival.

Intubation setting and mortality in trauma patients undergoing hemorrhage control surgery: a propensity score-matched analysis

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Background and Goal of Study: Endotracheal intubation is essential for airway management in trauma patients but may cause hemodynamic instability and delay resuscitation. Recent studies suggest emergency department (ED) intubation may be linked with higher mortality compared to operating room (OR) intubation in trauma patients. However, it is unclear if these findings apply to broader trauma populations, including civilian and military patients.

This study uses a nationwide trauma registry to assess the association between ED intubation and in-hospital mortality in major trauma patients.

Materials and Methods: Registry-based analysis of the Israeli National Trauma Registry evaluating major trauma patients (Injury Severity Score [ISS] ≥ 16) requiring hemorrhage control surgery within an hour of admission between 2016-2023. ED intubation was the primary exposure. Multivariable logistic regression and propensity score matching adjusted for confounders, including injury severity, vital signs, penetrating injury, and blood product administration.

Results and Discussion: The study included 975 patients, 470 (48.2%) of whom were intubated in the ED. ED-intubated patients had significantly higher ISS and a higher proportion of profound shock than OR-intubated pateitns. In-hospital mortality was higher among patients intubated in the ED (22.6%) compared with OR intubation (8.5%). Unadjusted logistic regression showed ED intubation was associated with higher odds of in-hospital mortality (OR: 3.13, 95% CI: 2.15-4.62).

After adjusting for confounders, the association became nonsignificant and persisted across sensitivity analyses. Propensity score matching resulted in 1:1 matching of 271 patients per group. balancing characteristics such as ISS, shock, Glasgow Coma Scale, and penetrating injuries.

After matching, mortality rates were similar (12.5% ED vs. 12.2% OR), and logistic regression did not demonstrate a significant association between ED intubation and mortality (OR: 0.97, 95% CI: 0.58-1.61). ED intubation was linked to a two-fold increase in ICU admission odds in adjusted and matched analyses.

Conclusion(s): ED intubation was not significantly associated with increased in-hospital mortality after controlling for injury severity and shock.

These findings suggest ED intubation, while more frequent in severely injured patients, has an unclear independent impact on mortality in trauma patients undergoing urgent surgery, warranting further prospective research.

24AP02-9

Virtual Reality (VR) based CPR algorithm model as educational and training tool for medical and allied health professions students

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Background and Goal of Study: The use of immersive technologies for medical education, which place students in a virtual environment whereby they can perform practical procedures as well as interact with a variety of simulated clinical scenarios. In medical education, the three main types of technology used to construct these simulated environments are: virtual reality (VR), augmented reality (AR) and mixed reality (MR).

The present study prospectively analyzed the feasibility and usefulness of a virtual reality (VR) platform for BLS (Basic Life Support) CPR algorithm training during studies of 1st year academic students in a variety of medical professions.

Materials and Methods: This study is prospective and observational. Overall, 279 1st year students (medical, emergency medicine-paramedics, physiotherapy and nurses students) were included in the study. Of them, 140 students were included in control (Group 1, students who learned the standard educational protocol of BLS CPR including hands on training); and 139 students in study (Group 2, Students who learned the standard educational protocol of BLS CPR with hands on experience and additionally experience a VR-based platform learning of the BLS CPR algorithm model) of the present study. VR platform for present study was built and integrated by UAB Cloyd IXR company.

Results and Discussion: We demonstrated that the percentage of final OSCE score trended higher in the study group (Group 2, VR-based platform) in all medical specialties. There was significantly high OSCE score grades for the nursing (p<0.023) and physiotherapy (p< 0.024) students populations compared to the control group (Group 1).

Moreover, in present study we shared questionnaire regarding the learning experience on VR-based platform of CPR BLS. All students populations reported better comfortability, safety and understanding CPR BLS algorithm using VR-based platform.

Conclusion(s): Our study demonstrated a potential usefulness of VR -based platform in CPR BLS algorithm learning experience. We suggesting it is a safe, simple and effective practice for medical education.

Acidemia augments lactate level elevations in the prediction of survival but not the neurological outcome of cardiac arrest patients

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Background and Goal of Study: Acidemia is independently associated with higher mortality in several shock types. Therefore, we analyzed the additive value of pH decrease on top of serum lactate levels in predicting mortality and neurological development of cardiac arrest (CA) patients following cardiopulmonary resuscitation (CPR).

Materials and Methods: The predictive power of initial pH and lactate levels was retrospectively analyzed in non-traumatic CA patients admitted to a high-volume center in Germany (University Clinic Duesseldorf). The association between these biomarkers and 30-day mortality was assessed using receiver operating characteristic (ROC) curves. Patients were stratified by the Youden Index for lactate levels and the clinically established pH threshold 7.2. 30-day mortality was analyzed between the four stratified groups.

An independent association between pH and survival was established using Cox regression analyses with adjustments for several CPR-related variables, including lactate. Preliminary findings were validated in the eICU database, which comprises data from over 2000 patients across multiple intensive care units in the United States of America.

Results and Discussion: Initial lactate and pH levels showed high accuracy in predicting 30-day mortality (area-under-curve of 0.83 and 0.75, respectively, p<0.0001). Patients with pH levels ≤ 7.2 had significantly higher mortality in each lactate stratification group. The hazard ratios for pH ranged between 0.1 and 0.3 and remained significant after adjusting for lactate, age, CPR duration, and type of cardiac arrest.

When applying individual thresholds from this analysis to patients in the eICU database, a pH ≤ 7.2 accurately distinguished groups at higher mortality risk in each analyzed lactate group.

Multiple logistic regression showed an HR of 0.14 (p<0.0001) for each pH unit after lactate, age, and initial creatinine level adjustment. No significant association was observed between initial pH levels and neurological outcomes. Correlation analyses showed only a mild relationship between lactate and pH levels in both analyzed collectives.

Conclusion(s): pH levels augment the predictive capacity of lactate, with values of pH ≤ 7.2 independently indicating higher mortality in cardiac arrest patients, regardless of lactate levels. pH does not accurately predict neurological outcomes in CPR survivors.

24AP03-1

Association between COVID-19 vaccination and mechanical ventilation in critically ill COVID-19 pneumonia patients

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Background and Goal of Study: In Malaysia, COVID-19 vaccination was introduced following WHO guidelines on 24 February 2021. This study aimed to examine the relationship between COVID-19 vaccination status and the need for invasive mechanical ventilation in critically ill patients with COVID-19 pneumonia. Additionally, the study sought to evaluate co-morbidities and demographic factors among these patients and assess the severity of organ dysfunction at intensive care unit (ICU) admission using the Sequential Organ Failure Assessment (SOFA) score.

Materials and Methods: This was a retrospective, single-center study conducted at Hospital Kuala Lumpur, Malaysia involving patients with COVID-19 pneumonia admitted to the ICU between July 1, 2021, and February 28, 2022. Data collection included demographic characteristics, comorbidities, vaccination status (complete vs. incomplete), and clinical parameters such as SOFA scores and PaO2/FiO2 ratios. Logistic regression analysis was utilized to identify factors associated with the requirement for invasive mechanical ventilation.

Results and Discussion: Among 340 patients with COVID-19 pneumonia admitted to the ICU, 42.6% required invasive mechanical ventilation. Incomplete vaccination status significantly increased the likelihood of requiring mechanical ventilation (Adjusted Odds Ratio [AOR] 2.09, 95% CI: 1.115-3.946, p=0.002). Higher SOFA scores (AOR 1.653, 95% CI: 1.457-1.853, p<0.001) and moderate PaO2/FiO2 ratios (AOR 0.302, 95% CI: 0.115-0.790, p=0.015) were also linked to increased ventilation needs. The complete vaccination group exhibited reduced mechanical ventilation duration and lower mortality compared to the incomplete vaccination group, reinforcing the protective role of full vac-

Conclusion(s): COVID-19 vaccination was significantly associated with improved outcomes in critically ill patients, particularly by decreasing the necessity for invasive mechanical ventilation and reducing ICU mortality.

These findings highlight the importance of complete vaccination in mitigating severe COVID-19 outcomes, emphasizing vaccination as a critical component in managing high-risk patient populations.

24AP03-2

Use of ECMO-CPR in in-hospital cardiac arrest secondary to anaphylactic shock: a case report

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Background: Extracorporeal Membrane Oxygenation for Cardiopulmonary Resuscitation (E-CPR) is a life-saving technique for cardiac arrest (CA) patients unresponsive to conventional CPR. While E-CPR extends the window for addressing reversible CA causes, its benefits, optimal patient selection criteria, and procedural timing remain unclear.

Case report: We present a 66-year-old woman with a history of NSAID allergy, obesity, smoking, and essential tremor treated with propranolol. She was scheduled for a right tumorectomy under general anesthesia due to a breast intraductal papilloma.

Ten minutes after surgery began, the patient developed severe bronchospasm, hypoxemia, and bradycardia unresponsive to atropine or adrenaline. Advanced life support (ALS) was initiated, revealing pulseless electrical activity (PEA) as the initial rhythm. Intra-arrest transoesophageal echocardiography showed no right ventricular dilation or cardiac tamponade signs.

After 15 minutes of ALS, PEA persisted, prompting E-CPR protocol activation. Ultrasound-guided right femoro-femoral veno-arterial cannulation (23Fr-17Fr) was performed. ECMO support was initiated 38 minutes after tresucitation onset, achieving pulsatility with proper aortic valve opening and maintaining adequate peripheral perfusion pressure.

A normal pulmonary CT angiography ruled out pulmonary embolism. Elevated acute tryptase (211 ng/mL) suggested refractory anaphylactic shock, later confirmed by the allergology department.

The patient improved in the ICU, achieving successful ECMO weaning after 7 days. She was discharged 40 days later with a good neurological outcome (Cerebral Performance Category ICPCI 2).

Discussion: Survival rates for in-hospital cardiac arrest (IHCA) at discharge range from 15–25%, with 60–80% achieving favorable neurological outcomes (CPC 1–2). ECMO during IHCA is associated with a 37.9% survival rate and favorable CPC in up to 84.4% of cases.

Specialized and multidisciplinary teams are critical to facilitate decisions and minimize "low-flow time". In this case, E-CPR likely prevented worse neurological outcomes.

Reference:

Abrams, D., MacLaren, G., Lorusso, R. et al. *Extracorporeal* cardiopulmonary resuscitation in adults: evidence and implications. Intensive Care Med 48, 1–15 (2022).

Learning points: ECMO reduced low-flow time, likely improving neurological outcomes. Further research is needed to define E-CPR indications, timing, and cost-effectiveness compared to conventional CPR.

24AP03-3

ECMO as a life-saving intervention in acute respiratory failure refractory to conventional therapies

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Background: This case underscores crutial role of veno-arterial extracorporeal membrane oxygenation (VA-ECMO) as a life-saving intervention in patients with severe respiratory insufficiency unresponsive to conventional therapies.

Case Report:18-years-old patient polytrauma patient sustained critical injuries, including hemopneumothorax and severe respiratory failure, following a motor vehicle accident. He underwent multiple computed tomography (CT) scans, including one prior to admission and several during hospitalization, alongside mechanical ventilation.

Despite comprehensive supportive measures – mechanical ventilation, sedation, and multidisciplinary care – the patient's respiratory function and gas exchange deteriorated progressively. The clinical course was complicated by significant blood loss, with no evident bleeding source identified on CT imaging.

Multiple bronchoscopy procedures were performed, ultimately localizing the bleeding source, which necessitated surgical intervention

The patient underwent a right bilobectomy to control the hemorrhage. However, despite these efforts, the patient's respiratory condition continued to decline. VA-ECMO was initiated as a last-resort therapy, leading to stabilization and eventual full recovery of respiratory function.

Following successful decannulation, the patient was transferred back to the intensive care unit (ICU) for ongoing management.

Discussion:This case illustrates the complexity of managing polytrauma patients with multifactorial challenges, including respiratory failure, surgical complications, and hemodynamic instability. It highlights the necessity of advanced interventions such as ECMO and extensive surgical management.

The successful outcome was attributed to regular imaging, targeted diagnostic procedures, and a collaborative, multidisciplinary approach.

References:

Namendys-Silva SA. ECMO for ARDS due to COVID-19. Heart & Lung: The Journal of Cardiopulmonary and Acute Care. 2020 Jul 1:49(4):348-9.

Learning points: Mechanical ventilation, ECMO, ARDS

24AP03-4

Enhancing CPR safety with BIS monitoring and VA ECMO in perioperative cardiac arrest: a case report

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Background: During cardiopulmonary resuscitation (CPR), optimizing cerebral perfusion and minimizing neurological injury are critical. The bispectral index (BIS) offers real-time feedback on cortical activity and sedation depth, providing a unique tool to guide CPR guality.

This report describes a perioperative cardiac arrest during ambulatory platelet-rich plasma (PRP) injection combined with hip arthrocentesis, managed with VA ECMO and BIS monitoring to enhance safety and outcomes.

Case Report: A 60-year-old male smoker with emphysema underwent PRP injection combined with hip arthrocentesis under general anesthesia. Forty minutes into the procedure, following the PRP injection, the patient developed hypotension, hypoxemia, and cardiac arrest with pulseless electrical activity. Despite 20 minutes of high-quality advanced cardiac life support (ACLS), return of spontaneous circulation was not achieved.

VA ECMO was initiated to address the refractory arrest, with fat embolism syndrome suspected as the underlying cause. BIS monitoring, used throughout the resuscitation, showed not suppressed cortical activity (BIS values >20). Real-time BIS feedback guided CPR quality, ensuring cerebral perfusion and supporting sedation adjustments during ECMO initiation. With ECMO support, hemodynamic stability was restored. The patient was successfully weaned from ECMO after 48 hours, with intact neurological function, and fat embolism syndrome was confirmed.

Discussion: This case highlights the potential of BIS monitoring to enhance CPR safety by optimizing cerebral perfusion and guiding resuscitation quality. BIS-guided interventions during VA ECMO initiation ensured optimal neurological recovery conditions. Integrating BIS into advanced resuscitation protocols could significantly improve outcomes, particularly in perioperative settings.

References:

1. Seder D B, et al. Feasibility of bispectral index monitoring to guide early post-resuscitation cardiac arrest triage.

Resuscitation. 2014; 85(8):1030-6

Learning Points: Combining VA ECMO and BIS monitoring enhances CPR safety by prioritizing cerebral protection and optimizing resuscitation. This approach may serve as a model for improving outcomes in complex resuscitation scenarios and warrants further exploration (1).

24AP03-5

Relevance of reversible causes of out-of-hospital cardiac arrest (REBECCA)

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Background and Goal of Study: Early identification of reversible causes of out-of-hospital cardiac arrest (OHCA) is crucial for effective treatment. Portable diagnostic tools, including prehospital ultrasound, toxicological screening, and blood gas analysis, play a key role in facilitating timely and accurate diagnosis.

This study aims to assess the prevalence of reversible causes of OHCA.

Materials and Methods: This prospective single-center study was conducted in the Vienna metropolitan area. Patients were included if they experienced an OHCA and if prehospital ultrasound, blood gas analysis, and toxicological screening could be integrated into the advanced life support algorithm.

Exclusion criteria included age under 18 years, suspected pregnancy, and delays in treatment or transport due to study enrolment.

Results and Discussion: From April 2023 to August 2024, data were collected on 81 patients with complete diagnostic information. In 30 cases (37.0%), resuscitation was terminated in the prehospital setting, while 51 patients (63.0%) were transported to hospital. 43 (84.3%) of the transported patients achieved a sustained prehospital return of spontaneous circulation.

A reversible cause of cardiac arrest was identified in 42 cases (51.9%; Fig. 1), although in 11 of these cases (26.2%) resuscitation was terminated prehospital.

Notably, in 15 of all cases, the findings of the extended approach in identifying reversible causes of OHCA led to a change in therapy (n=9, 11.1%) or influenced the choice of destination hospital (n=6, 7.4%).

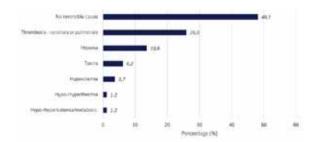


Fig 1. Reversible causes of out-of-hospital cardiac arrest.

Conclusion: These preliminary data suggest that a potentially reversible cause of OHCA can be identified in more than half of cases. However, completing a comprehensive diagnostic workup to identify the underlying cause remains a significant challenge. Acknowledgements: We thank Luca Dronigi, Sybille Behrens, Angelika De Abreu Santos, Martina Hermann, Guenter Gmeiner, Christoph Reisinger, and Daniel Grassmann for their support in helping us carry out this study.

Persistent inflammation, immunosuppression, and catabolism syndrome: New murine sepsis model

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Background and Goal of Study: Sepsis, defined as dysregulation of immune and inflammatory responses to infection, can develop refractory shock and multiple organ failure (MOF) leading to early in-hospital death or persistent inflammation, immunosuppression, and catabolism syndrome (PICS) leading to extended recovery periods and multiple complications. The recent development of programs that support earlier diagnosis and intervention with best-practices for sepsis should increase the portions of PICS. However, these processes of develop to PICS from sepsis are not well-understood.

Materials and Methods: In this study, we utilized cecal ligation and puncture (CLP) method in mice for three steps sepsis models involving SIRS and CARS (CLP only), MOF (lipopolysaccharide (LPS) + CLP), and PICS (LPS + CLP + Antibiotic) models. We examined mortality, the levels of pro- and anti-inflammatory cytokine, mitogen-activated protein kinases (MAPKs), nuclear factor kappa b (NF-κB) expression in lung and immune cell involving neutrophils, T cells, and myeloid derived suppressor cells (MDSCs) recruitment in serum.

Results and Discussion: Mortality were 100% (MOF), 60% (PICS), 20% (SIRS/CARS), and 0% (SHAM). We found that mice develop MOF at day 5 post-CLP surgeries, and pro-inflammatory cytokines were elevated from days 5–10. In the contrast, anti-inflammatory cytokines express highly level after 24hr from surgery, and continued to significantly increase from days 5 to 10 in PICS.

Furthermore, the recruitment of MDSCs were significantly augmented over time; whereas neutrophils recruitment and T cells functions were elevated at day 5 and decreased at day 10 post-CLP surgeries.

We also observed an increase of the mortality of PICS model, approximately 60% of mice had died after 14 days.

Conclusion(s): Our results contribute to characterization of three sepsis phases, which may support the diagnosis and treatment of sepsis in the future.

24AP03-7

The REBECCA interactive checklist to determine reversible causes during out-of-hospital cardiac arrest

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Background and Goal of Study: In patients suffering from outof-hospital cardiac arrest (OHCA), detection and treatment of reversible causes, besides adequate cardiopulmonary resuscitation (CPR) and defibrillation improves patients' survival. Team leading on scene can be demanding due to several circumstances and thus be associated with an increased cognitive load.

The aim of this study was to design a checklist to determine the reversible causes during OHCA.

Materials and Methods: We designed an interactive mobile checklist for reversible causes of OHCA (Fig.1) within a focus group of ten emergency physicians at the Medical University of Vienna. Furthermore, 20 emergency physicians analysed the usability of the checklist through questionnaires.

Results and Discussion: Of all participants, 70% were specialists with a median time working on the emergency response vehicle of 2.0 (1.0-4.3) years. Most participants were confident about their level of experience with OHCA and yet still, 85% of participants found the checklist to be helpful. The majority preferred the digital checklist over a paper-based and liked the fact that it was linked to the point-of-care ultrasound (POCUS) application.

Many participants appreciated the colour-coding, but stated against adding an acoustic alarm in case when a reversible cause is detected. Although there was no significant need for further details on most causes, a small majority favoured more information on intoxication and electrolyte disorders.



Fig.1 The REBECCA checklist.

Conclusion: Our study showed that the majority, regardless of their training level, found the REBECCA checklist helpful, while there was almost no need for further detailed information on the reversible causes in particular. This underlines the importance of reducing cognitive load by preparing clear instructions that allow

to stay focused. The wish for more information on relatively rare reversible causes may reflect their often-versatile presentation, making diagnosis even harder.

Acknowledgements: We gratefully thank all participants as well as A. Schmid, A. De Abreu Santos, D. Grassmann, M. Krammel, and A. Stria for their invaluable contribution.

24AP03-8

Clinical cases of veno-venous extracorporeal membrane oxygenation in patients with refractory status asthmaticus

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Background: This study presents a clinical evaluation of venovenous extracorporeal membrane oxygenation(VV-ECMO) in patients with refractory status asthmaticus (RSA) complicated by unresponsive to conventional respiratory support and protectivemode mechanical ventilation(MV) requiring.

A retrospective analysis was conducted on 4 patients who underwent VV-ECMO for RSA. Each clinical case explored different approaches to respiratory support.

Case Report: The cohort included 4 females aged 22 to 37 years. All cases were complicated by severe respiratory failure (RF) necessitating endotracheal intubation and MV with non-protective parameters. Despite the medical therapy the patient's conditions didn't improve and experienced complications from elevated airway pressure including subcutaneous emphysema, pneumothorax and pneumomediastinum - complications contraindicated the continuation of high-pressure MV. We used VV-ECMO as therapy to correct RF and reduce risk of complications worsening when MV and medical treatment didn't correct it.

Early initiation of VV-ECMO improved gas exchange parameters and prevented the RF progression in all cases. The patients were successfully weaned off ECMO and discharged in satisfactory condition.

Discussion: Advances in bronchial asthma treatment have reduced mortality to 6,5-10,3%. The application of VV-ECMO minimized the risk of ventilator-induced lung injury by enabling lungprotective MV settings and facilitates accelerated respiratory recovery with a reported survival rate of approximately 85 %1. The research Zakrashek JK et al. (2022) highlights that VV-ECMO reduces mortality, without affecting the duration of hospitalisation2. References:

1. Shivanand Medar, MD, Giles JPeek, MD, D. Rastogi, MD. Extracorporeal and Advanced Therapies for Progressive Refractory Near-Fatal Acute Severe Asthma in Children. Pedi atrPulmonol.2020Jun;55(6):1311-1319.doi:10.1002/ppul.24751 PMID:32227683

2. Zakrajsek JK, Min SJ, Ho PM, Kiser TH, Kannappan A, Sottile PD,Allen RR,Althoff MD,Reynolds PM,Moss M,Burnham EL, Mikkelsen ME, Vandivier RW. Extracorporeal Membrane Oxygenation for Refractory Asthma Exacerbations With Respiratory Failure.Chest.2023 Jan;163(1):38-51.doi:10.1016/j. chest.2022.09.029.Epub 2022 Sep 30.PMID: 36191634;PMCID: PMC10354700.

Learning points: The findings underscore the potential, clinical relevance of VV-ECMO as an escalated intervention in severe asthma exacerbations with respiratory failure and complications connected with high airway pressure.

24AP03-9

Optimizing flow-controlled ventilation: impact of I:E ratios and oxygen concentration in a porcine model of total airway obstruction

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Background and Goal of Study: Airway obstruction is a medical emergency requiring immediate intervention in the pre-hospital settings. When the insertion of a larger bore tube over a bougie catheter is hindered by obstruction, flow-controlled ventilation (FCV) combined with expiratory ventilation assistance (EVA) may offer an alternative solution.

This method employs an inspiratory-to-expiratory (I:E) ratio of 1:1 with continuous bidirectional flow, necessitating a high-pressure gas source, typically 100% oxygen, However, oxygen supplies may be limited or pose safety risks in austere pre-hospital or military environments.

Additionally, alterations in the I:E ratio can influence intratracheal pressures and hemodynamics.

We hypothesized that arterial oxygenation with 21% oxygen would vary between different I:E ratios and, secondarily, that FCV/EVA would remain feasible in terms of PaO₂, PaCO₂, oxygen delivery (DO₂), consumption and extraction rates, intratracheal pressures, and hemodynamic stability.

Materials and Methods: In this randomised cross-over trial, FCV/ EVA with different I:E ratios and fraction of inspired oxygen were compared in total airway obstruction during 15 minutes of ventilation. Male swine (n=6), mean weight 56.6 (2.1) kg, were anaesthetised, muscle relaxed and desaturated <80%.

A bougie catheter, sealed in a connector, was inserted into the endotracheal tube and FCV/EVA was initiated in an obstructed porcine airway model.

Results and Discussion: In I:E 1:1 vs 1:2 with 21% oxygen, mean difference (MD) of SaO₂ was 33.8% (95% CI: 16.3-51.4, p=0.002) and PaO₂ was 4.7 kPa (95% CI: 1.3-8.1, p=0.01), at five minutes from desaturation. PaCO2 was more efficient in 1:1 than 1:1 with a pause and 1:2. PaCO₂ remained <5 kPa with small variability in 1:1 with 21% oxygen. MD was -1.3 kPa (95% CI: -2.0-(-)0.6, p=0.002), in 1:1 vs 1:2 with 21%, at five minutes.

Indexed DO_a increased significantly in 1:1 with 21%. Intratracheal minimal pressures in I:E 1:2 were severely negative and significantly different from 1:1 with 21% oxygen (p<0.0001). Hemodynamics remained unchanged.

Conclusion(s): I:E ratio of 1:1 was feasible and superior to 1:2 in terms of SaO₂, PaO₂ and PaCO₂ with 21% oxygen. DO₂ remained above critical thresholds, and SaO2 levels were adequate throughout the intervention. This approach may offer a viable alternative in a totally obstructed airway in resource-limited or austere settings where higher oxygen concentrations are unavailable.

Nitric oxide supplementation during cardiac arrest induces inflammation and apoptosis in rat hearts

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Background and Goal of Study: Neuroprotection during cardiac arrest and cardiac and aortic arch surgeries has garnered significant attention, with various protocols developed to optimize neurological outcomes. Among these, nitric oxide (NO) supplementation via extracorporeal membrane oxygenation (ECMO) has shown promise in influencing neurological outcomes during cardiac surgeries. However, its direct effects on the myocardium remain underexplored.

This study investigates the molecular and physiological impacts of NO supplementation on the heart during cardiac arrest.

Materials and Methods: Male Sprague Dawley rats (n=20, 450–550 g) were anesthetized, cooled to a core temperature of 19 \pm 1°C, and subjected to 30 minutes of hypothermic cardiac arrest. Subsequently, the rats were rewarmed to a target temperature of 35°C over 60 minutes using extracorporeal life support either without (control group) or with NO supplementation (20 ppm, experimental group) using ECMO.

By the end of the experiment, hearts were harvested for analysis, including RNA sequencing, RT-PCR, and assessment of oxidative stress markers such as superoxide dismutase (SOD)malondial-dehyde (MDA).

Results and Discussion: RNA sequencing revealed that NO supplementation differentially regulated genes involved in lipid metabolism, oxidative phosphorylation, inflammatory signaling, proteasome formation, autophagy, calcium handling, smooth muscle relaxation, and apoptosis compared to the control group. RT-PCR confirmed these findings.

The experimental group exhibited a six-fold increase in inflammatory markers IL-1 and NF- $\kappa\beta$. Oxidative stress markers showed elevated MDA levels and reduced SOD activity in the NO-treated group, indicating increased oxidative stress. NO supplementation also led to apoptosis in the myocardium, evidenced by a 50% rise in TUNEL-positive nuclei compared to controls.

Notably, while the control group demonstrated elevated $\alpha 1$ and $\beta 1$ adrenergic receptor expression, NO supplementation normalized these levels but induced a three-fold increase in $\beta 2$ adrenergic receptor expression.

Conclusion(s): NO supplementation during cardiac arrest exacerbates oxidative stress, triggering a heightened inflammatory response and increased apoptosis in the myocardium.

These findings suggest that the adverse effects of NO may be mediated through oxidative stress pathways, warranting further investigation into its therapeutic application during cardiac surgeries.

24AP03-11

Transdiaphragmatic cardiac massage during laparotomy – quick access, greater success? A case report

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Background: Cardiorespiratory arrest (CA) in the perioperative period is rare but can be fatal and it's usually quickly detected due to continuous monitoring. Internal cardiac massage (ICM) via thoracotomy was the standard treatment until the 1960s, but external chest compressions (ECC) are now the first-line approach. ICM should still be considered if spontaneous circulation is not restored. Transdiaphragmatic ICM may be a valuable alternative for CA during laparotomy.¹

Case Report: A 73-year-old male, ASA II, underwent an urgent total gastrectomy due to a perforated gastric neoplasm. On the 6th postoperative day, he developed shock. The emergency team suspected hemorrhagic shock and started untyped blood transfusion. Orotracheal intubation was performed, and the patient was taken for exploratory laparotomy.

During surgery, massive hemoperitoneum was identified, originating from a lesion in the gastroduodenal artery, which was promptly treated. The patient then experienced CA with pulseless electrical activity, and advanced life support (ALS) maneuvers were initiated.

Once the origin of the shock was controlled, opening the diaphragm was suggested for ICM, which led to full recovery after 4 cycles of ALS. The patient was transferred to the intensive care unit, with the possibility of extubation in the immediate postoperative period and a full recovery with preserved neurological function.

Discussion: Previous studies confirm better cardiac indices, coronary perfusion pressures, and higher rates of recovery of spontaneous circulation in patients undergoing ICM. Due to the increased cardiac output achieved with ICM, metabolic deterioration occurs more slowly, justifying longer resuscitation maneuvers to treat reversible causes. In patients with CA during laparotomy, the transdiaphragmatic approach provides quick, easy access with minimal additional trauma.

In our clinical case, rapid access to the heart by opening the diaphragm and pericardium allowed high-quality ALS maneuvers, resulting in complete recovery without neurological deficits.

References:

1. Schnüriger B, et al. Transdiaphragmatic resuscitative open cardiac massage: description of the technique and a first case-series of an alternative approach to the heart. World J Surg. 2014 Jul;38(7):1726-9

Learning points: In patients with CA during laparotomy, the transdiaphragmatic approach allows quick and easy access to the heart, with excellent ALS performance.

Prolonged successful VV ECMO in COVID-19 pandemic

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Background: Patients with COVID-19 who require mechanical ventilation have a high mortality rate, and VV ECMO (veno-venous extracorporeal membrane oxygenation) may serve as a lifesaving intervention, especially for young patients with single-organ failure. According to the ELSO Registry, in-hospital mortality for COVID-19 patients on ECMO is 47%, with only 26% of patients successfully discharged to home or rehabilitation facilities.

Case Report: A 43-year-old male with a history of mild hypothyroidism and smoking was hospitalized 3 days after testing positive for COVID-19. By the 16th day, due to severe respiratory failure, he was placed on awake VV ECMO with spontaneous breathing. After three days, he was intubated, and ECMO support continued for 97 days (a total of 2,325 hours).

During this time, the patient experienced multiple episodes of massive bleeding, including nasopharyngeal, ECMO cannulation sites, and tracheostomy-related bleeding. He received 33.3 liters of red blood cells, 3.74 liters of platelets, 17.6 liters of fresh frozen plasma, and 5.25 liters of cryoprecipitate. His lowest platelet count was 19,000, and he tested negative for heparin-induced thrombocytopenia.

The patient also experienced a single prolonged CPR event during ECMO, although kidney function remained intact. After 119 days of hospitalization, he was transferred to an acute rehabilitation center. Several months later, he achieved full recovery and returned to his pre-COVID activity level.

Discussion: This case represents one of the longest documented instances of VV ECMO support in Israel for COVID-19-related ARDS. Despite prolonged ECMO duration, extensive blood product transfusions, and a prolonged CPR event, the patient's lung function was eventually restored, allowing him to fully recover. The case underscores the critical role that ECMO can play in COVID-19 patients with severe respiratory failure, even with prolonged complications.

References: https://www.elso.org/registry.aspx

Learning Points:

- VV ECMO can be an effective rescue therapy for patients with COVID-19-induced ARDS, especially in younger individuals with single-organ failure.
- Timely intervention with ECMO may help prevent multi-organ failure, and in some cases, allow full lung recovery.
- This case emphasizes the value of persistent support and comprehensive care in achieving favorable outcomes for critically ill COVID-19 patients.

Pain and Palliative Medicine

25AP01-1

Evolution of published randomised controlled trials on non-opioid analgesics for postoperative pain: a bibliometric study

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Background and Goal of Study: This study aimed to analyse the changes by year in the number of publications of randomised controlled trials (RCTs) on non-opioid analgesics for postoperative pain.

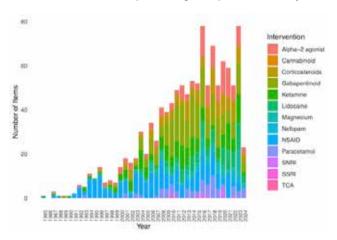
Materials and Methods: We conducted a systematic review in July 2024 of major electronic databases (MEDLINE, Embase and CENTRAL). We included RCTs with available full text, that administered a single non-opioid analgesic versus placebo either preor intra-operatively and assessed postoperative pain outcomes. We did not include studies which focussed on non-opioids to treat established postoperative pain.

We analysed the change in the number of publications using negative binomial regression. Effect estimates are presented as incident rate ratios (IRR) with 95% confidence intervals (CIs). All analyses were conducted in R statistical software.

Results and Discussion: We included 1149 RCTs. There has been a large increase in the number of publications since 1985, which may have stabilised over the last 15 years (Figure 1).

Beyond their introduction into clinical practice, there is no clear trend in the number of publications when considering the type of agent used (Figure 1).

The number of publications has increased by around 10% per year (IRR 1.10; 95% CI 1.08 to 1.11). There continues to be a large number of RCTs on non-opioid analgesics published each year.



Conclusion(s): There is an urgent need to appraise the large evidence base of RCTs of non-opioid analgesics in order to reduce the risk of potential research waste, provide new evidence of treatment efficacy and guide the conduct of future RCTs.

25AP01-2

The potential of modern non-opioid analgesics in the prevention and treatment of pain syndrome in decompressive-stabilizing spine surgeries

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Background and Goal of Study: The study compared the effectiveness of intravenous NSAIDs (Ibuprofen) and a combination of NSAIDs (diclofenac + orphenadrine) with tramadol to optimize pain management in cancer patients with chronic pain syndrome (CPS) due to metastatic spinal lesions (MSL) during spinal surgeries.

Materials and Methods: A total of 87 patients (39 men and 48 women, M±SD 60.48±9.55 years) with CPS due to MSL were included. Patients were randomized based on the type of analgesia: in the control group (T, n=28), tramadol was used, while in the comparison groups (D, n=30), diclofenac and orphenadrine combination or ibuprofen (I, n=29) were administered i/v intraoperatively and for 2 days postoperatively. Pain intensity was assessed at rest and on exertion using a visual analog scale (VAS, mm) at the following time points: during extubation (1), during transfer in the intensive care unit (2), 1 hour (3) and 3 hours (4) postoperatively, at 21:00 on the day of surgery (5), and at 06:00 the next day (6). Statistics included non-parametric tests.

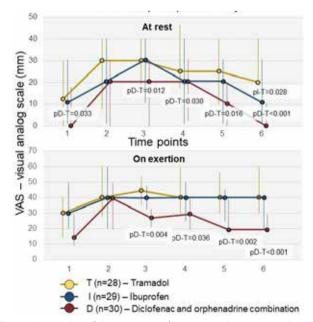


Figure. Dynamics of the intensity of post-op pain syndrome in groups at rest and on exertion in the 1st postoperative day.

Results and Discussion: It was shown that D was more effective than T at rest time points 1,3,4,5,6 (Me 0.00 vs. Me 12.5, p=0.033; Me 20.00 vs. Me 30.00, p=0.012; Me 20.00 vs. Me 25.00, p=0.030; Me 10.00 vs. Me 25.00, p=0.016; Me 0.00 vs. Me 20.00, p<0.001 respectively) while I had greater analgetic effect only at time point 6 (Me 10.00, p=0.028).

Similar results were obtained on exertion: D was more effective at time point 3.4.5.6 (M±SD 27.67±15.30 vs. M±SD 44.29±22.68. p=0.004; Me 20.00 vs. Me 40.00, p=0.036; Me 20.00 vs. Me 40.00, p=0.002; Me 20.00 vs. Me 40.00, p<0.001 respectively). Duration of analgesia (min) in D was longer than T or I (Me 450.00 vs. 97.50 or 120.00, p=0.019).

Opioid-sparing effect was in groups D and I; median daily dose of tramadol was 100.00, p<0.001 vs. 200.00, and the duration (day) of opioid therapy was significantly lower than in groups T (Me 5, Me 6 vs. Me 7; p< 0.001, p=0.017).

Conclusion: Pain management in patients with MSL using combined NSAIDs is more effective than with ibuprofen or tramadol. Future research with larger sample sizes is necessary to confirm these findings.

25AP01-3

Quantitative Sensory Testing (QST) in patients with high frequency and burst Spinal Cord Stimulation (SCS), follow-up

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Background: SCS after implantation is rated as "successful" when it achieves ≥50% pain relief. Although in this population, burst or high-frequency stimulation was considered successful, several patients reported a change or a reduction in its effect, especially after switching to non-perceptible stimulation.

The primary aim of this study was to investigate the associations between initial SCS outcomes and long-term SCS pain

Methods: Monocentric.non-randomized.follow-up observation of routine, standardized therapeutic measurements in 32 patients with either low back pain, radiculopathy or with pseudo-radiculopathy, who received aSCS unit and who had been treated successfully with HF or burst stimulation for one to three years. QST was first performed with the SCS system switched on stimulating the painful area.

Afterwards, stimulation was paused for 24h. The residual effect should have been vanished after this lapse of time.

Results: All patients including 20 women 63% aged between 32-83 years completed the trial. Temperature sensitivity as well as pain perception were not significantly altered after paused stimulation: Cold Detection CDT; P=0.61, Warm Detection WDT; P=0.66, Cold Pain Threshold CPT; P=0.56, Heat Pain Threshold HPT; P=0.16. SCS stimulates afferent nerve fibres, flooding the $A\beta$ fibres with tactile input, thus activating the GATE neuron and alleviating pain by inhibiting the spinothalamic neuron.

Conversely, stopping the stimulation for only 24 hours quickly deactivates the pain inhibitory neurons.

This was demonstrated in our study by a significant pain sensitivity to pinprick and pressure and clear signs of allodynia. No significant difference was shown in wind-up and vibration swell.

Conclusions: Paused SCS implies that different peripheral fibre classes, induce pain sensitization whose spatial spread and secondary hyperalgesia result in increased sensitivity to pinprick. pressure, vibration, and touch.

Nociceptive alpha- δ and A-B afferents, which mediate pain sensitization, are deactivated by spinal cord stimulation in prolonged chronic pain, but are easily and rapidly reactivated when stimulation is turned off. C-fibres' homo- and heterotopic long-term pain potentiation can be assessed by temperature perception during

In contrast to the observed quick deactivation of pain inhibitory neurons after paused SCS C-fibres are not rapidly reactivated. We assume that different mechanisms are involved in this path-

25AP01-4 Pain management for emergency laparotomies

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Background and Goal of Study: Emergency laparotomy is a common surgical procedure, which has significant associated morbidity and mortality. Poorly managed pain contributes to postoperative complications. However, research surrounding pain management for emergency laparotomies is limited, particularly compared to the abundance of literature on elective colorectal and other major surgical procedures. We performed a service evaluation to assess pain management after emergency laparotomy in a London hospital.

Materials and Methods: We reviewed data for emergency laparotomies performed in adults aged 18 years and above between March 2023 and March 2024. Patients were identified by searching the hospital database (Surginet) and additional clinical information gathered from individual patient records.

We collected data on commonly used pain management techniques including epidurals, spinals, rectus sheath catheters and patient-controlled analgesia (PCA) pumps. We recorded the number of patients who complained of moderate or severe pain on arrival to the Post Operative Recovery Unit (PACU) to assess the effectiveness of each analgesia technique.

Results and Discussion: A total of 59 patients were identified. Regional anaesthesia techniques were used for 75% of patients. PCAs were used commonly alongside a regional technique as part of pain management post-operatively. 56% of patients were transferred to PACU post-operatively while the remaining patients were admitted to the Intensive Care Unit (ICU).

Analgesic technique	Proportion of patients	Proportion of patients receiving a PCA	Proportion of patients reporting moderate or severe pain in PACU
Epidural	39%	39%	11%
Spinal	19%	82%	0%
Rectus Sheath Catheter	17%	70%	38%
No regional technique	25%	27%	33%

Currently a multi-modal approach is used to manage pain postoperatively in patients undergoing emergency laparotomies at St Mary's Hospital. A significant proportion of patients are admitted to ICU post-operatively and this may influence individual analgesia plans.

We found that neuraxial analgesia is particularly effective in managing early postoperative pain and was more effective than rectus sheath catheters in this patient cohort.

Conclusion: Based on our findings we would recommend that neuraxial techniques should be included in the analgesia plan of patients undergoing emergency laparotomies whenever possible. Rectus sheath catheters should be considered in cases where neuraxial analgesia is contraindicated.

25AP01-5

Pain management model for acute postoperative pain in adults: a network meta-analysis

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Background and Goal of Study: An optimal pain management model is essential for guiding postoperative care and monitoring. This study aimed to compare the efficacy of various pain management models for managing acute postoperative pain in adults. Materials and Methods: Databases in English (PubMed, Web of Science, Embase, Cochrane Library) and Chinese (CNKI, WAN-FANG, SinoMed, Chinese Medical Ace Base) were systematically searched to identify randomized controlled trials (RCTs) that examined the efficacy of different postoperative pain management models. Two researchers independently conducted the search and screening, with discrepancies resolved by a third researcher. Data, including postoperative pain intensity measured by the Visual Analog Scale (VAS) or Numeric Rating Scale (NRS), were collected for network meta-analysis using STATA 18.

Results and Discussion: The network meta-analysis included 37 RCTs with a total of 5,815 postoperative adult patients. Results demonstrated that the acute pain service model (SMD = -0.79, 95% Cl: -1.39, -0.18), nurse-based anesthesiologist-supervised acute pain service model (SMD = -1.82, 95% CI: -2.37, -1.28), and multidisciplinary pain management team model (SMD = -1.32, 95% CI: -1.74, -0.89) were more effective than the traditional pain management model in reducing VAS scores 24 hours after surgery. When comparing the three models, the nurse-based anesthesiologist-supervised acute pain service model was more effective than the acute pain service model (SMD = -1.04, 95% CI: -1.60, -0.47) in reducing the maximum postoperative VAS score, with no significant difference observed between the nurse-based anesthesiologist-supervised model and the multidisciplinary team model (SMD = -0.51, 95% CI: -1.20, 0.18) in VAS scores 24 hours post-surgery. The SUCRA curve analysis indicated that the nursebased anesthesiologist-supervised acute pain service model was the optimal approach for managing postoperative pain.

Conclusion(s): The acute pain service model, nurse-based anesthesiologist-supervised acute pain service model, and multidisciplinary pain management team model were all more effective than the traditional pain management model. Among these, the nursebased anesthesiologist-supervised acute pain service model was identified as the optimal strategy for postoperative pain management.

25AP01-6

Pain after adenotonsillectomy in pediatric patients: is it adequately controlled?

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Background and Goal of Study: Postoperative pain management in pediatric patients undergoing adenotonsillectomy is a significant clinical concern. Adequate pain control is essential for recovery, reducing the risk of complications, and improving overall patient satisfaction.

This study evaluates the effectiveness of various pain management strategies in 100 children who underwent adenotonsillec-

Materials and Methods: A survey was conducted in 10 hospital anesthesia departments on 100 pediatric patients (ages 4-12 years) undergoing adenotonsillectomy. Pain management protocols included preoperative, intraoperative, and postoperative interventions with a combination of opioid and non-opioid analgesics, as well as regional anesthesia in select cases.

The primary outcome measure was the reduction in postoperative pain, assessed using the Wong-Baker FACES Pain Rating Scale at 6, 12, and 24 hours post-surgery.

Secondary outcomes included incidence of postoperative nausea and vomiting (PONV) and the need for additional analgesics. Results and Discussion: At 6 hours postoperatively, 72% of patients reported mild or no pain, while 18% experienced moderate pain, and 10% had severe pain. By 24 hours, the proportion of patients with mild or no pain increased to 85%. The use of a combination of acetaminophen, ibuprofen, and local anesthetic infiltration significantly reduced pain levels compared to opioidbased regimens.

The incidence of PONV was low (7%) and was significantly lower in patients who received multimodal analgesia. The need for additional analgesics was minimal in most patients.

Conclusion(s): Multimodal analgesia, including non-opioid medications and local anesthesia, is highly effective in managing postoperative pain in children undergoing adenotonsillectomy.

These strategies reduce the need for opioids, minimize side effects, and provide better pain control, facilitating a faster recovery. Future studies should explore the long-term effects of these strategies on pain outcomes and quality of life.

References:

- 1. Johnson, T.P., & Green, J.T. (2023). Efficacy of multimodal analgesia in pediatric adenotonsillectomy: A randomized controlled trial. Pediatric Anesthesia, 33(4), 377-384.
- 2. Patel, S., & Lee, A. (2022). Pain management in pediatric adenotonsillectomy: A review of current practices. Journal of Pediatric Surgery, 57(10), 2151-2157.

25AP01-7

Music for pain relief: investigating music preferences for pain management across twenty countries

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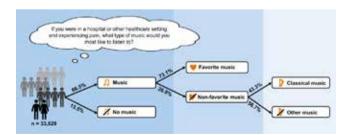
Background and Goal of Study: Music is increasingly used in healthcare to manage pain, anxiety, and stress. This study investigates 1) to what extent people across twenty countries are willing to listen to music for pain relief in healthcare settings, and 2) which music genres they choose, in light of their national context, background characteristics, and overall music preferences.

Additionally, we examine the universality of the 'Mozart effect,' which describes the belief that classical music is most effective in healthcare, despite evidence that favorite music, regardless of genre, is most effective.

Materials and Methods: We used data from the International Federation of the Phonographic Industry's international survey, which included one question from our research group: "If you were in a hospital or other healthcare setting and experiencing pain, what type of music would you most like to listen to?" Data were analyzed using logistic multilevel regression models to examine the influence of gender, age, income, and race-ethnicity on music preferences for pain relief.

Results and Discussion: The study surveyed 33,629 participants across 20 countries. The mean age was 38.4 years. Overall, 13.5% preferred no music when in pain. Most participants chose their favorite music genres for pain relief (63.5%). Females and older participants were more likely to choose non-favorite music. Income and ethnicity influenced preferences in a subgroup analysis of the USA and UK. Pop music was the most chosen genre, followed by classical and mellow music.

Conclusions: A large majority (86.5%) of the global population is willing to listen to music when experiencing pain in healthcare settings (see Figure).



Participants predominantly chose their favorite music, with classical music being the most common choice when selecting a genre not aligned with their overall music preference. This supports the 'Mozart effect,' the belief that classical music is particularly effective for pain relief.

Differences between national populations and social groups highlight the need for a culturally sensitive and personalized approach to using music as medicine in healthcare settings.

25AP01-8

Perceptions of music listening for pain management: a mixed-methods study

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Background and Goal of Study: Integrating music into pain management is a promising nonpharmacological approach to improve patient outcomes, but its implementation remains challenging. Studies have shown that music can alleviate pain and reduce anxiety. Despite the evidence, implementing music in clinical practice faces barriers such as lack of knowledge and poor communication. Additionally, the subjective experience of music listening in the context of pain is not well-studied.

This study explores healthy volunteers' perceptions of music for pain management, focusing on their attitudes, implementation strategies, and subjective experiences.

Materials and Methods: This mixed-method study included a quantitative survey (n=169) and qualitative interviews (n=20). It is a follow-up to a randomized trial on music genres' influence on pain tolerance, conducted six months after the initial experiment, where participants received music listening advice. The protocol (ETH2324-0398) has been approved by the ESHCC Research Ethics Review Committee of Erasmus University Rotterdam.

The survey was distributed via Qualtrics software (Version 2020©. Qualtrics, Provo, UT). Quantitative data were analyzed with SPSS (IBM Corp., Chicago, USA) version 28.0. Interviews were semistructured and analysed following a thematic analysis.

Results and Discussion: Participants showed a high willingness to use music in healthcare, particularly for so-called emotional pain. Individual attitudes varied regarding type of music, situation and pain. Barriers included not remembering the option to listen to music and social sensitivity. Consequently, the optimal situation for music in healthcare is shown in the Figure 1.

A proactive approach by healthcare professionals was emphasised and nearly all interview participants emphasized the importance of having control and autonomy. Interestingly, the "wrong" type of music or the "wrong" situation were considered as nonbeneficial or even harmful.

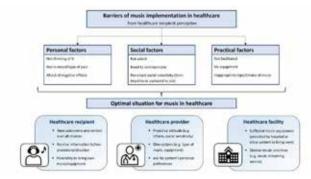


Figure 1.

Conclusions: Awareness of individual needs and potential negative emerged as crucial factors. To effectively implement music in healthcare, a proactive and personalized approach is required.

25AP01-9

Management of spastic paraplegia with intrathecal alcohol injection: a case report

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Background: Spastic paraplegia can significantly impair the quality of life in patients with spinal cord lesions due to trauma. Traditional management strategies often fall short in providing adequate relief. This case report explores the use of intrathecal alcohol injection as a novel approach to convert spastic muscle contractions and pain to a flaccid state in a patient with a spinal cord lesion.

Case Report: We present a 62-year-old male patient with a spinal cord lesion at the T12 level resulting from a traumatic injury. The patient suffered from continuous involuntary muscle contractions and pain in the lower limbs, severely impacting his daily comfort and overall well-being. In an effort to alleviate spasticity, a therapeutic intervention using intrathecal pure alcohol injection was performed.

Discussion: The intrathecal injection of pure alcohol effectively targeted the spasticity associated with the spinal cord lesion, leading to a successful transition from spastic paraplegia to a flaccid state. This intervention not only provided substantial pain relief but also improved the patient's comfort.

The case underscores the potential of intrathecal alcohol injection as a viable option for pain management and spasticity reduction in patients with spinal cord injuries.

References:

- 1. Tzeng, R. C., & Lee, H. J. (2018). Efficacy of Intrathecal Alcohol Injection for Spasticity in SCI Patients. Spinal Cord, 56(9), 825-832.
- 2. Karlsson, A. K., et al. (2019). Pain Management in Spinal Cord Injury: New Perspectives and Therapies. Pain Physician, 22(2), E123-E130.

Learning Points:

- Intrathecal pure alcohol injection can be effective in managing spastic paraplegia associated with spinal cord lesions.
- This approach provides an alternative for patients unresponsive to conventional therapies.
- Further research is warranted to explore the long-term effects and safety of this technique.

25AP01-10

Neurolytic transverse abdominal plane block with alcohol for severe abdominal pain resulting from abdominal wall metastasis: a case report

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Background: The concentration and dose of alcohol used in transverse abdominis plane (TAP) neurolysis have been reported to vary from case to case (67% 12 ml, 77% 13 ml, 60% 25 ml, 33% 15 ml).

Case Report: A 67-year-old woman diagnosed with a gall bladder tumor accompanying metastasis to the liver, ovary, and abdominal wall visited the pain medicine outpatient clinic. She complained of aching pain in the right flank, with a VAS score 8. A CT imaging 3 weeks prior showed 4.2 cm RLQ anterior abdominal wall metastasis.

Ultrasound-guided right TAP block was performed twice at 7-day intervals using a mixed solution of 0.75% ropivacaine 10 ml and 2% mepivacaine 10 ml. Immediately after the TAP block, the patient reported that the pain disappeared, but the pain returned 7 hours later.

Two days after the second TAP block, the patient visited the emergency room complaining of right flank and pelvic pain, nausea, and vomiting with a VAS score of 10. On the abdominal CT scan taken at the time, the abdominal wall mass size increased (6.3 cm), and the patient complained of severe nausea and vomiting due to the side effects of intravenously administered morphine and refused pain medication.

The next day, after pain relief was confirmed with a TAP block using 5 ml of 0.75% ropivacaine under ultrasound guidance, TAP neurolysis was performed using a mixed solution of 2.5 ml of 0.75% ropivacaine and 7.5 ml of 100% alcohol. The total alcohol concentration and volume used in TAP neurolysis were 50% and 15 ml, respectively. Immediately after TAP neurolysis, the patient reported complete relief of right flank pain and no complications. The patient died 6 weeks after TAP neurolysis receiving hospice care. For 6 weeks, the patient complained of pain around the umbilicus (VAS 2), right pelvic pain (VAS 4), and back pain (VAS 6), but no right flank pain.

Discussion: Following the neurolytic TAP block using 15 ml of 50% alcohol, the patient had significant pain relief lasting about 6 weeks until the patient passed away. In addition, TAP neurolysis has been affected by reducing opioid consumption.

Reference:

Hung JC, Azam N, Puttanniah V, Malhotra V, Gulati A. Neurolytic Transversus Abdominal Plane Block with Alcohol for Long-Term Malignancy Related Pain Control. Pain Physician 2014; 17(6): F755-60.

Learning Points: What percentage of alcohol is appropriate for TAP neurolysis?

How much injection volume is needed for TAP neurolysis?

25AP01-11

Persistent abdominal pain after laparoscopic cholecystectomy - risk factors and lidocaine impact

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Background and Goal of Study: The incidence of persistent abdominal pain after laparoscopic cholecystectomy is estimated between 9% to 25%. Data concerning persistent abdominal pain after elective laparoscopic cholecystectomy (PAPELC) intensity and its neuropathic characteristics is scarce. Lidocaine is used on multimodal analgesia however intravenous lidocaine (IVL) benefit on PAPELC is not clarified. The authors pretend to determine PA-PELC prevalence and risk factors, characterize the intensity, and categorize as neuropathic pain. Intraoperative IVL impact was explored in the PAPELC population.

Materials and Methods: A cross-sectional study was performed in 2021 after institutional approval. Included patients subjected to elective laparoscopic cholecystectomy (ELC) under general anesthesia in 2018 were surveyed via telephone after informed consent. Demographics data, perioperative analgesia, acute pain control and PAPELC intensity and DN4 classification were analyzed. The Numeric Pain Scale Score (NPSS) in the first 48 hours was registered.

Results and Discussion: Included 93 (71%) participants and a 15.05% prevalence of PAPELC was observed. About 57.1% of PA-PELC patients reported moderate to severe pain (NPSS≥4) and 28.6% classified as neuropathic pain.

The potential risk factors for PAPELC observed were height (r=-0.287;p=0.005), pain during the first 48 hours (r=0.404;p<0.001) and its control (U=365;p<0.001), postoperative morphine administration (r=0.248;p=0.017) and postoperative complications (r=0.518;p<0.001).

Dexamethasone administration was PAPELC related (r=-0.205;p=0.048). IVL was used in 27 cases and the decrease of the PAPELC risk was observed on ≥2mg/kg/h dose (OR=0.73). The need for opioid rescue (r=-0.201;p=0.054) and intraoperative fentanyl (H-KW=11.22;p=0.004) was related to ≥2mg/kg/h IVL doses.

The IVL dose was negatively associated with postoperative paracetamol (r=-0.270;p=0.009) and NSAIDs (r=-0.217;p=0.037).

Conclusion(s): This is the first study on patients' outcome evaluation after ELC regarding PAPELC prevalence, intensity, and DN4 classification and the IVL role on PAPELC. The observed PAPELC prevalence is according to published data.

The authors found an increased percentage of NPSS≥4 in PA-PELC patients. The potential risk factors for PAPELC observed were acute postoperative pain and its control, rescue opioid administration, and postoperative complications. On adequate IVL dose, a reduction in PAPELC risk was identified.

25AP01-12

Effective pain management through cryoneurolysis: a case report of brachial plexus cryoablation in advanced breast cancer

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Background: Pain management in advanced cancer patients remains challenging, particularly when nerve structures are involved. This case report discusses the use of cryoneurolysis for alleviating severe brachial plexus pain due to metastatic breast cancer with the local invasion of the brachial plexus.

Case Report: We present a 53-year-old female patient diagnosed with end-stage breast cancer, exhibiting local invasion and metastasis affecting the left brachial plexus. The patient experienced debilitating pain and plegia, significantly impacting her quality of life. After exhausting conventional pain management strategies, we opted for brachial plexus cryoneurolysis as an intervention.

Discussion: The cryoneurolysis procedure was performed, providing targeted pain relief by interrupting nerve conduction. The patient achieved remarkable results, enjoying six months of complete pain relief. Upon recurrence of pain, cryoneurolysis was repeated, again yielding excellent results. This case highlights the effectiveness of motor nerve cryoablation in managing palliative pain in cancer patients, demonstrating that it can be a safe and reproducible procedure.

References:

- 1. Smith, J. A., & Jones, M. B. (2021). Advances in Palliative Pain Management. Journal of Pain Research, 15, 123-130.
- 2. Patel, R., et al. (2020). Role of Cryoanalgesia in Cancer Pain Management. Pain Medicine, 21(4), 733-740.

Learning Points:

- · Cryoneurolysis can provide significant relief for severe cancer pain associated with brachial plexus nerve involvement.
- It is a minimally invasive option that can be safely repeated when necessary.
- · Understanding its application can enhance palliative care strategies for cancer patients suffering from refractory pain.

25AP02-2

Update on the management of acute postoperative pain in the renal transplant patient

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Background and Goal of Study: Currently we perform a multimodal analgesic treatment, with effective techniques and drugs (cost-effectiveness ratio) for acute postoperative pain in patients undergoing renal transplantation.

The effective treatment of acute postoperative pain, in addition to reducing costs, improves the quality of care, reduces secondary complications, in addition to the hospital stay and provides greater comfort for the patient during the postoperative period. In this type of intervention, pain can be considered moderate to severe, hence the need for follow-up and treatment by the ADU. Prior to this study, pain management was performed with iv morphine boluses on patient demand.

Materials and Methods: The study included 70 patients, six months from the start of the protocol, renal transplant recipients included in the period from the day of surgery to the first 48 hours post-surgery. The postoperative analgesic control protocol contemplates several branches of pain management, depending on whether the patient presents moderate pain (VAS 7-8), where a continuous infusion of: tramadol 300 mg + ondansetron 12 mg to be administered in 24 hours IV is started.

On the other hand, if the patient presents severe pain (VAS >8), we have four possible options, being (a): continuous infusion of morphine. Option (b) an incisional catheter: Ropivacaine 0.2% 5-7 ml/h. Option (c) epidural catheter: Ropivacaine 0.2% via epidural. Option (d) Tap block infiltration: Ropivacaine 0.5% 20-30 ml.

In addition to all of them, infiltration of the subaponeurotic fascia in the operating room.

Results and Discussion: Tramadol pump was used in 80% of cases. It was only necessary in 20% with VAS >8 treatment with the other four branches where none proved to be superior to the others.

In comparison, since the beginning of this protocol >75% of the patients presented pain < 5 compared to the previous treatment (morphine on demand to boluses if pain). Complications: 5-7% of PONV, and <1% paralytic ileus.

25AP02-3

Subcutaneously implanted epidural ports for management of severe cancer pain: two case reports

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Background: The number of cancer patients who wish to receive palliative care at home has been increasing in Japan. Managing severe cancer pain effectively while enabling discharge to home remains a challenge.

We present two cases where implantation of an epidural port provided effective pain control, allowing the patients to transition to home care.

Case Report 1: A 44-year-old woman presented with right-sided chest pain caused by meningeal carcinomatosis from lung cancer. Despite high-dose opioid therapy (up to 2000mg morphine daily), pain control was inadequate, and the patient experienced somnolence as a side effect. An epidural port was placed for epidural administration of morphine and ropivacaine, reducing morphine usage to 25-200mg per day. The patient was discharged to home two weeks later with effective pain management.

Case Report 2: A 55-year-old woman with ovarian cancer, lung metastases, and pelvic lymphadenopathy presented with severe left groin and abdominal pain (NRS 8/10). Initial systemic opioid therapy was insufficient. An epidural port was placed for continuous administration of local anesthetics and opioids, reducing her pain to NRS 0-1/10. She was discharged 10 days later with pain effectively controlled through the epidural system.

Discussion: The use of implanted epidural ports in these cases highlights their effectiveness in providing adequate pain control while reducing opioid load and side effects such as somnolence and sedation. Both patients transitioned to home care with improved quality of life. No implant-related infections were observed, demonstrating the safety and reliability of this technique. These cases emphasize the role of epidural analgesia in advanced cancer pain management and its potential to support home-based palliative care.

Conclusion: Implanted epidural ports can provide effective pain relief while minimizing opioid-related side effects, enabling hospital discharge and home-based care.

Reference:

1. Inoue D, Sakuyama T, Ichiba T, et al. [Usefulness of epidural catheter with the subcutaneous reservoir for cancer pain control in homecare service]. Gan To Kagaku Ryoho. 2011;38(Suppl 1):61-3.

Learning Points: Severe cancer pain in the home-based palliative care setting may be managed by epidural analgesia via an implanted epidural port, reducing systemic opioid requirements and minimizing side effects.

25AP02-4

Genome-wide expression profiling of the amygdala in neuropathic pain rats

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Background and Goal of Study: Pain is an unpleasant sensory and emotional experience. The amygdala is known to play a crucial role in both nociceptive and emotional processing. Recent studies suggest that the right amygdala may have a more pronociceptive function, while the left amygdala appears to be less involved.

This study aimed to explore differential gene expression in the left and right amygdalae of neuropathic pain rats. Genome-wide expression profiling was performed to identify pain-related genes that are specifically expressed in the amygdala.

Materials and Methods: Amygdalae were obtained from three rat pain models (male Sprague-Dawley) at 3, 9, and 14 days postspinal nerve ligation (SNL), with pain confirmed by the von Frey test. Microarray analysis and quantitative qRT-PCR were used to identify differentially expressed genes in the amygdalae at each time point.

Additionally, we examined whether gene expression differed between the left and right amygdalae in the SNL model (n = 3 per time point). Experimental procedures were conducted in accordance with the animal care guidelines of the Korean Academy of Medical Science (Animal Ethics Committee of Chungnam National University Hospital: CNUH-014-A0005-1).

Results and Discussion: Tight ligation of the L5 spinal nerve induced allodynia in the left hind paw by day 3 post-ligation. Gene expression analysis revealed a significant increase in the expression of Npsr1 (Neuropeptide S receptor 1), Nr4a2 (Nuclear receptor subfamily 4, group A, member 2), Rgs18 (Regulator of G-protein signaling 18), and Satb2 (SATB homeobox 2) in the right amygdala on day 3 post-SNL.

On day 9, Adora2a (Adenosine A2a receptor) and Rgs9 (Regulator of G-protein signaling 9) were significantly upregulated in the right amygdala, and on day 14. Stoml3 (Stomatin-like 3) expression was significantly increased in the right amygdala compared to the left (p \leq 0.05, Table1).

Conclusion(s): These results suggest that the right amygdala may play a more prominent role than the left amygdala in the processing of neuropathic pain in rats.

25AP02-5 Patients with post-breast surgery chronic pain: a case series

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Background: Chronic pain after breast surgery is a common condition, affecting patients' quality of life. Chronic shoulder pain can arise as a secondary complication, limiting arm mobility and daily activities. This case series describes four patients with chronic shoulder pain associated with breast cancer treatment and assesses different treatment approaches.

Methods: This case series includes four patients who developed chronic shoulder pain related with post-breast surgery chronic pain. DN4 questionnaire was used to identify neuropathic features of breast pain, and numeric rating score (NRS) were recorded before and after interventions for both breast and shoulder pain.

Therapeutic approaches included physiotherapy and ultrasoundguided corticosteroid injections for shoulder pain, and topical 8% capsaicin for breast neuropathic pain.

Results and Discussion: All patients were female. The average age of the patients was 49.5 years. Three of the four patients had an initial diagnosis of breast cancer, with an average time since diagnosis of 58.7 months ranging from 24 to 83 months. Time since breast surgery had an average of 50 months, with a range from 23 to 77 months. DN4 scores corroborated the neuropathic component of breast pain in 3 out of 4 patients, with a range of 4-7. Two patients were treated with topical capsaicin, with pain reduction >30%. In three patients was also performed ultrasoundguided corticosteroid injections, with >50% pain reduction.

Conclusion: This case series describes and evaluates the treatment of patients with chronic shoulder pain following breast surgery, emphasizing the importance of recognizing patients with post-surgical breast chronic pain, particularly those with neuropathic pain, as a high-risk group for developing chronic shoulder pain. Early identification and intervention in this population may help reduce long-term disability and improve quality of life.

25AP02-6

Bipolar pulsed radiofrequency as a light of hope in post-traumatic xiphodynia: a case report

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Background: Bipolar Pulsed Radiofrequency (BPRF) is a minimally invasive procedure used for pain management. Post-traumatic xiphodynia can be associated with severe dysfunction in daily activities, especially in young and active individuals. BPRF can be utilized in cases refractory to medical treatment.

Case report: We report the case of a 33-year-old male with a history of an electric motorcycle accident 5 years prior. Following the accident, he developed constant pain in the xiphoid process region, with progressively increasing intensity, exacerbated by exertion and superficial palpation. Trials with analgesics such as non-steroidal anti-inflammatory drugs, metamizole, paracetamol, pregabalin, and nutraceuticals were unsuccessful.

Relief was only achieved with combined tramadol 37,5 mg and paracetamol 325mg, which he used as needed due to excessive drowsiness.

On the numerical pain scale, he reported a maximum of 9 out of 10, a minimum of 4 out of 10, and an average of 7 out of 10. The Douleur Neuropathique 4 questionnaire was negative. Thoracic computed tomography showed no musculoskeletal abnormali-

In this context, a bipolar pulsed radiofrequency procedure was performed under ultrasound guidance at the intermediate zone of the xiphoid process (the most painful area), with needles placed transversely to the xiphoid process, delivering a total of 6 minutes of treatment, with posterior administration of dexamethasone 8 mg and ropivacaine 6 mg.

One month after the treatment, the patient reported no baseline pain, with few episodes of breakthrough pain, reaching a maximum of 5/10, with very sporadic use of as-needed medication.

Discussion: This case presents Bipolar Pulsed Radiofrequency as a possible treatment option for patients with post-traumatic xiphodynia, particularly those unresponsive to conventional pharmacological therapies.

To our knowledge, there are no similar cases described in the literature. Although the follow-up period is short, the results are promising and suggest a potential treatment pathway for refractory cases.

Further studies are needed to confirm these results.

Bajaj H, Drake D. Utility of Pulsed Radiofrequency Ablation in Xiphodynia. Pract Pain Manag. 2019;19(3).

Learning points:

- 1. BPRF offers a minimally invasive alternative for patients unresponsive to conventional pharmacological treatments.
- 2. BPRF can provide effective pain relief for patients with refractory post-traumatic xiphodynia.

25AP02-7

Efficacy and safety of meloxicam nanocrystal injection for postoperative analgesia in adult patients undergoing laparoscopic surgery: a multicenter, randomized, double-blind, placebo-controlled phase III trial

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Background and Goal of Study: Postoperative pain after laparoscopic surgery is a significant issue, delaying recovery and affecting quality of life. Despite various analgesic methods, more effective and safer options are needed. Meloxicam, a nonsteroidal anti-inflammatory drug (NSAID), has shown analgesic and anti-inflammatory effects. Meloxicam nanocrystal injection is expected to have improved pharmacokinetic properties and enhanced ef-

This study aimed to evaluate the efficacy and safety of meloxicam nanocrystal injection for postoperative analgesia in adult patients undergoing laparoscopic surgery.

Materials and Methods: This multicenter, randomized, doubleblind, placebo-controlled phase III trial included adult patients aged 18-65 scheduled for elective laparoscopic surgery under general anesthesia, with expected surgery duration <4 hours and a postoperative hospital stay ≥48 hours. Eligible patients had NRS pain scores ≥4 within 4 hours postoperatively.

Patients were randomized to receive either meloxicam nanocrystal injection (30 mg once daily for 2 days, intravenous) or placebo (1 mL normal saline once daily for 2 days, intravenous).

The primary endpoint was the time-weighted sum of pain intensity differences over 24 hours (SPID24).

Secondary endpoints included time-weighted total pain relief scores (TOTPAR). SPID at other intervals, time to first use of rescue analgesics, frequency of rescue analgesic use (0-24 and 24-48 hours), proportion of patients requiring rescue analgesics, total rescue analgesic use, and the patient's global assessment of analgesia (PGA) at 48 hours.

Results and Discussion: A total of 222 patients from 8 centers were randomized. The SPID24 in the meloxicam nanocrystal injection group was significantly better than the placebo group (P < 0.0001), meeting the primary endpoint.

Secondary efficacy endpoints showed significant improvements in the meloxicam group, demonstrating superior analgesic effects. In terms of safety, the incidence of adverse events (AEs) was lower in the treatment group compared to the placebo group. Most AEs were mild to moderate and resolved without intervention.

Conclusion(s): Meloxicam nanocrystal injection is effective for moderate to severe postoperative pain following laparoscopic surgery. It significantly reduces pain and the need for rescue analgesics, with good safety and tolerability.

25AP02-8

Enhanced vs. standard pain management of patients at risk for chronic post-surgical pain: a randomized controlled pilot trial

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Background and Goal of Study: Moderate to severe chronic postsurgical pain (CPSP) occurs in up to 12% of patients 6 months post-surgery, according to a large European cohort study. Some hospitals have implemented "transitional pain services" (TPS) to implement strategies to reduce the risk of transition from acute to CPSP. The impact of the TPS on the occurrence of CPSP remains to be demonstrated. In this pilot trial, we tested the feasibility of performing a trial answering this question.

Materials and Methods: We conducted a randomized, single center, open-label pilot clinical trial with as 1:1 allocation. Patients scheduled for spine, total knee replacement or thoracic surgeries (with a stratification 2:2:1), aged 18 years old or more, speaking and reading French, were included. Patients filled in baseline questionnaires assessing psychological risk factors and preexisting chronic pain.

After surgery, patients allocated to the TPS group were followed by the TPS team consisting of members of the acute and chronic pain teams working together. The TPS proposed individually targeted measures. Patients in the control group received usual care by a surgeon and/or general practitioner. Patients were followed for 6 months.

The primary outcome was the recruitment rate.

Secondary outcomes were retention rate, data completeness rate, and incidence of CPSP at 6 months. No statistical test was applied.

Results: 60 patients were randomized. Mean age was 65.1 (SD12.1), mean BMI was 28.4 (SD4.4), 29 were female, 54 had chronic pain before surgery and 21 patients had pain at surgery site. Mean VAS pain intensity before surgery was 6.2 (SD1.8). The mean recruitment rate was 10 patients per month.

Complete data from 50 patients could be analyzed at 6 months. Only 20 of 30 patients in the TPS group had a visit by the TPS team, and 5 patients were followed by the TPS team until 6 months. 23 of 50 patients with available data had chronic pain at 6 months after surgery, 18 of them chronic pain at the site of surgery, 5 presented increased pain intensity at 6 months.

Conclusion(s): This pilot study supports the feasibility of a larger randomized trial in terms of patient recruitment for the selected types of surgery.

However, an efficient TPS needs sufficient resources which were not available at the time of the study, resulting in a low rate of patients visited and followed-up. The endpoints to be examined should be clarified in a patient and public involvement perspective.

25AP02-9 **HSK21542** in patients with postoperative pain: one phase 3, multicentre, double-blind, randomized, controlled trials

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Background and Goal of Study: HSK21542, a peripherally restricted kappa opioid receptor agonist, was evaluated for efficacy and safety in patients with postoperative pain following abdominal surgery. This was assessed in a phase 3, multicentre, randomized, double-blind, controlled trials (HSK21542-303) in China. Materials and Methods: HSK21542-303 was a three-arms study comparing HSK21542 1.0 µg/kg with tramadol 50 mg/dose and placebo. All treatments were administered intravenously.

The primary endpoint was the time-weighted summed pain intensity differences over 24 hours (SPID_{0-24h}).

Secondary endpoints included SPID_{0-12h}, use of rescue analgesics, and PID; proportion of patients with NRS ≤3; duration of analgesia; and postoperative satisfaction score with analgesia.

Results and Discussion: HSK21542-303 demonstrated superiority of HSK21542 over placebo (least squares [LS] mean [± standard error], -64.0 [2.25] vs -45.9 [2.25]; P<0.001) in terms of SPID while non-inferiority to tramadol (LS mean difference, -1.1; 95% confidence interval, -7.4 to 5.1; P<0.001) (Figure 1).

Patients who received HSK21542 experienced reduced requirements for rescue analgesics, longer mean duration of analgesic effect, lower PID, and higher satisfaction scores among patients and physicians compared with placebo.

Furthermore, HSK21542 had a comparable safety profile to placebo, inducing fewer gastrointestinal adverse events compared with tramadol. More than 30% improvement in SPID 0-24h with HSK21542 compared with placebo was observed in this study. This magnitude of improvement was consistent with other trials of novel analgesics such as VX-548 (NaV1.8 inhibitor), meloxicam (COX-2 inhibitor) and oliceridine (µ-receptor G-protein pathway modulator) that utilized SPID24 as efficacy endpoint in abdominoplasty and bunionectomy (1-3).

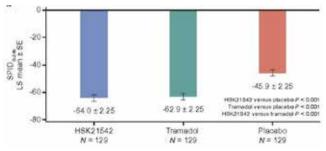


Figure 1. $SPID_{0-24h}$ after the post-operative administration of the first dose in HSK21542-303.

Conclusion(s): In conclusion, HSK21542 showed potent analgesic effect and was well tolerated in patients who underwent abdominal surgery and experienced postoperative pain.

25AP02-10

Intracanal radiofrequency for chronic neuropathic pain: Three case reports

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Background: Chronic neuropathic pain is often refractory to conventional therapies, posing a significant clinical challenge. Intracanal radiofrequency (IRF) has emerged as a minimally invasive technique for modulating neural signal transmission.

This case series illustrates IRF's effectiveness in chronic sciatic pain, post-surgical neuropathic pain following tumor resection, and post-herpetic neuralgia, highlighting its value in conditions with limited therapeutic alternatives.

Case Report:

Case 1: A 54-year-old male with chronic sciatic pain due to pelvic fracture, unresponsive to pharmacological and infiltration therapies. After RFI pain intensity reduced by 60% in 1 month. Residual mixed pain persisted at 5 months, managed with tailored pharmacotherapy.

Case 2: A 39-year-old male with chronic neuropathic pain after sacral carcinoma resection and radiotherapy. Despite opioids and adjuvants, pain remained severe. IRF resulted in a 70% pain reduction, enabling opioid cessation and functional recovery.

Case 3: A 78-year-old female with post-herpetic neuralgia, unresponsive to gabapentinoids, opioids and topical therapies. IRF resulted in pain resolution within one month, along with functional and psychological improvement.

The IRF was performed with a Racz catheter inserted through a 16G Touhy needle, under radiological guidance, to the affected dorsal root ganglia. Sensory and motor tests were performed prior to pulsed radiofrequency at each level. Treatment parameters: 45V, 5Hz, 5 ms, 4-8 min. The neutral plate was placed in the gluteus in cases 1 and 3, and in the inguinal region in case 2.

Discussion: These cases underline IRF's clinical relevance as a viable option for refractory chronic pain, where conventional therapies fail. Its minimally invasive nature and sustained outcomes support broader application in similar contexts.

Further studies are warranted to validate its long-term efficacy and safety.

Reference:

García García L, López de la Torre I, Sánchez Fernández G, et al. Tratamiento del dolor neuropático crónico mediante radiofrecuencia intracanal. Revista de la Sociedad Española del Dolor. 2017;24(6):386-394. doi:10.20986/resed.2017.3611/2017.

Learning points: IRF is effective and safe for managing chronic neuropathic pain of diverse origins and it offers significant functional improvement in patients with refractory conditions. There's a need for individualized and multidisciplinary pain management strategies.

25AP02-12

The effectiveness of informed consent using a spine model in patients undergoing lumbar epidural steroid injection: a prospective randomized study

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Aim: Informed consent is a critical process in medical care that ensures patients are fully informed about procedures or treatments, allowing them to make educated decisions regarding their health. This process is not only ethically and legally required but also helps set realistic expectations, reduce patient anxiety, and improve satisfaction. Visual aids can enhance understanding by helping patients grasp medical concepts and reduce misunderstandings. Low back pain is a common complaint, and lumbar disc herniation is frequently associated with this condition.

For patients who do not require surgery but still need pain management, minimally invasive procedures like lumbar epidural steroid injections are often performed. Informed consent is essential before these procedures.

This study aims to assess the effectiveness of informed consent obtained with a spinal model for patients undergoing lumbar epidural steroid injections.

Materials and Methods: From December 2023 to May 2024, 163 patients who underwent lumbar epidural steroid injections at Ankara University Department of Algology were included. The patients were randomly assigned to two groups: a control group receiving standard verbal and written informed consent, and a study group where the procedure was explained using a visual spine model.

The study assessed the level of understanding of the informed consent, patient satisfaction (using a Likert scale), and anxiety and depression scores before the procedure (using the patient anxiety and depression scale).

Results: The study group demonstrated a significantly higher level of understanding of the informed consent (p<0.001) compared to the control group.

Additionally, the anxiety and depression scores of the study group were significantly lower (p<0.001).

Conclusions: Enhancing the informed consent process with visual materials, such as a spinal model, can improve patients' understanding, reduce pre-procedural anxiety, and increase satisfaction by aligning expectations.

This study found that using a spinal model during informed consent for lumbar epidural steroid injections significantly improved patient understanding and reduced anxiety levels.

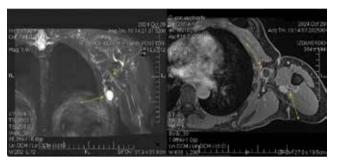
25AP03-1

Complex regional pain syndrome-related to axillary seroma and breast Mondor's disease after Mastectomy & Sentinel Lymph Node Dissection

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Background: Post-mastectomy pain syndrome (PMPS) is frequent. However, complex regional pain syndrome(CRPS) is rare when total mastectomy (TM) with sentinel lymph node dissection (SLND) is performed(1).CRPS due to entrapment of the intercostalbrachial nerve (ICBn) by a seroma is presented.





Case Report: A 45-y.o woman underwent bilateral TM for intraductal cancer and left axillary SLND. One month later she developed severe neuropathic pain, allodynia, hyperalgesia, trophic skin changes, and left arm/hand edema. Memantine, pregabalin, lidocaine patches, and physical therapy were started. She developed a recurrent axillary seroma that compressed the brachial plexus(BP), and ICBn entrapment due to breast Mondor's disease (BMD). MRI-neurography showed inflammation of lower brachial plexus. Stellate ganglion blocks, paravertebral block, various seroma drainages and administration of steroids into the pseudocapsule, provided significant analgesia. US-guidance application of platelet-rich plasma (PRP)around the BP produced a 60% clinical improvement and remission of allodynia in 15 days.

Discussion: PMPS is common (30-60%); however, CRPS is rare after TM&SLND. The persistence of a seroma can damage the BP.BMD may increase pain and the risk of CRPS(1,2).PRP may be an option for neural regenerative treatment(3).

References:

Graham L.E et al. Rheumatol Int. 2002;21(4):165-6. Monib S, et al. Cureus. 2021. PMID: 33758712. Papanikolaou A. et al.J.Clin. Med. 2022, 11, 5062,

Learning points: CRPS requires early treatment. Anti-neuropathic medications, sympathetic blocks, PRP and multidisciplinary care can improve outcomes.

25AP03-2

Reducing dietary branched-chain amino acids intake alleviates high-fat diet-induced pain sensitization and postoperative pain in male mice

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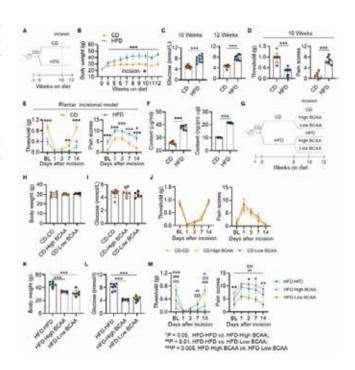
Background and Goal of Study: Pain is one of the main problems for modern society and medicine, being the most common symptom described by almost all patients. Dietary regimes affect pain alteration. This study aimed to elucidate the role of high-fat diet (HFD) on pain sensitivity and postoperative pain, and determine the potential effects of modulating branched-chain amino acids (BCAA) intake on pain phenotypes in preclinical studies.

Materials and Methods: Four-week-old male mice were fed a purified control diet (CD) or HFD for 10 weeks, followed by a hind paw incision. Four-week-old male mice were initially fed a CD or HFD for 8 weeks, then switched to the High or Low BCAA diet for another 4 weeks, and underwent a hind paw incision at 10 weeks of these diets. The BCAA content in homogenized DRG tissue or plasma samples were quantified with liquid chromatographytandem mass spectrometry. Pain behaviors were assessed.

Results and Discussion: Mice fed a HFD showed significant weight gain, starting at week 4 and lasting for 12 weeks, and elevated fasting blood glucose levels at 10 and 12 weeks (Fig A-C). HFD consumption induced pain sensitization and worsened postoperative pain (Fig D-E).

Consistent with previous study, in HFD mice, BCAA levels were significantly increased in plasma and L4-L5 DRGs (Fig F). Thus, we next questioned whether modulating BCAA intake would have effects on nociceptive and postoperative pain phenotypes (Fig **G**). In CD group, mice switching to High or Low BCAA diet displayed minor impacts on body weights, fasting blood glucose, and pain phenotypes (Fig H-J). In HFD mice, switching to High or Low BCAA diet benefited weight loss and fasting blood glucose (Fig K, L). High BCAA diet exacerbated hyperalgesia and postsurgical pain in high-fat feeding mice, whereas lowering dietary BCAA intake alleviated these pain effects (Fig M).

Conclusion(s): High BCAA intake has negative impacts on pain sensitivity and postoperative pain in high-fat feeding mice. Dietary BCAA restriction may be a novel non-pharmacological therapeutic to tackle pain sensitization and postoperative pain in individuals on a conventional high-fat diet.



25AP03-3

Alleviation effect of neuropathic pain by ZEB1 siRNA encapsulated PLGA nanoparticles in rat SNL model

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Background and Goal of Study: Neuropathic pain is a debilitating chronic condition that arises from lesions or diseases affecting the somatosensory nervous system, and it is estimated to affect 7-10% of the global population. This condition has a significant impact on patients' quality of life. Recent studies have revealed the crucial role of the zinc finger E-box-binding homeobox 1 (ZEB1) gene in the development and regulation of neuropathic pain. The Methoxy polyethylene glycol (mPEG)-Poly (D,L-lactic-co-glycolic acid) (PLGA) nanoparticles may be able to cross the blood-brain barrier and reach astrocytes in brain tissue, with even greater delivery efficiency when the astrocyte-specific target ligand is attached to the surface of the nanoparticles.

Materials and Methods: Use spinal nerve ligation (SNL) model. Prior to the surgical procedure, rats were subjected to von Frey filament testing.

only those that met the predetermined baseline (≥10 g) were included.

An animal model of SNL-induced neuropathic pain was established by ligating L5 spinal nerves in rats.

Behavioral assessments were performed.

On post-surgery day 7, mPEG treated ZEB1 siRNA nanoparticles and mPEG treated scrambled siRNA nanoparticles were administered via an intrathecal injection.

Results and Discussion: In the group that received mPEG treated ZEB1 siRNA nanoparticles, mechanical hypersensitivity began to decrease as early as day 4 after injection, with the most noticeable difference observed at day 18 compared to the mPEG treated scrambled siRNA nanoparticle injected group.

c-Fos expression was significantly reduced in the group that received ZEB1 siRNA nanoparticles compared with that in the group that received scrambled siRNA nanoparticles.

Conclusion: A study involving rats with SNL demonstrated that intrathecal delivery of ZEB1 siRNA using mPEG treated PLGA nanoparticles led to a substantial decrease in pain symptoms compared to the control group. Moreover, c-Fos expression in neurons was significantly reduced in the dorsal horn.

These findings suggest that the inhibition of ZEB1 may be an effective strategy for managing neuropathic pain.

However, it is essential to further investigate the multiple factors that may contribute to the reduction in c-Fos expression in neurons.

25AP03-5

The use of intravenous clonidine in postoperative pain management: a scoping review

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Background and Goal of Study: Clonidine, an alpha-2 receptor agonist, has been explored as a potential analgesic in postoperative pain management, but its efficacy and safety profile remain unclear.

The aim of this scoping review is to present the evidence on the use of intravenous clonidine in postoperative pain management. Materials and Methods: This scoping review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR). We searched the following databases: The Cochrane Library (CENTRAL), Embase and MEDLINE for studies investigating the use of intravenous clonidine in postoperative pain management on any outcomes or comparators. The extracted data were synthesized descriptively, focusing on pain scores, supplemental analgesia, and adverse effects.

Results and Discussion: We included eight randomized controlled trials. Most patients were ASA I-II and underwent major elective surgery. The studies varied widely in clonidine dosage and timing and combination with other analgesics.

All included studies reported outcome data for pain and supplemental analgesia with high variability in their strategies of assessment. The data showed inconsistency in the efficacy of clonidine in reducing pain scores or the amount of supplemental analgesia. Reported adverse effects were grouped into hemodynamics, respiration, and others and also showed inconsistency across studies.

Only some studies found reductions in pain scores or supplemental analgesics, which were mostly transiently significant.

The heterogeneity in timing and dosage of clonidine administration, as well as varying combination of other analgesics across studies and varying assessment strategies of outcomes on pain scores, supplemental analgesics and adverse effects further complicate the interpretation of results across studies.

Intravenous clonidine may have only limited use as an analgesic but could be considered as part of multimodal pain strategies, particularly for patients with contraindications for other agents, patients suffering from "acute-on-chronic pain", or patients with chronic opioid use.

Conclusion(s): The amount of evidence on the use of intravenous clonidine in postoperative pain management was low. Findings are specific for major elective surgeries with no specific indications for use. The reported evidence shows little effect of clonidine on pain scores and supplemental analgesia.

25AP03-6

Efficacy and safety analysis of the use of Sublingual Sufentanil in the management of acute postoperative pain: an observational study

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Background and Goal of Study: In recent years, the development of acute postoperative pain treatment has included an individualized approach to the patient, implementation of multimodal strategies and regional anesthesia techniques. At the Hospital Regional Universitario de Málaga, postoperative analgesia has had systematized protocols since 1993. However, it is still a challenge, since severe persistent postoperative pain affects between 2% and 10% of adults undergoing surgery.

The aim of this study is to analyze the real efficacy and safety profile of sublingual sufentanil 30ug (SST30) in clinical practice as a new analgesic alternative in the postoperative period.

Materials and Methods: Cross-sectional observational study. Survey conducted with 15 parameters to be measured to 28 anesthesiologists of the center, evaluating their experience to analyze the efficacy and safety of SST30 with one tablet per dispenser, between 12/2023 and 10/2024. A total of 21 anesthesiologists with experience with the drug were included, treating 235 patients in the postoperative period.

Results and Discussion: A 100% of respondents reported use in spine surgery, followed by 71.4% in thoracic surgery, 57.1% in major abdominal surgery and 52.4% in arthroplasty. A 23.8% and 71.4% reported immediate<5min and rapid<15min onset of action, respectively.

In terms of pain control, the most commonly reported parameter was "good: get mild pain" (81%), followed by "excellent: EVA 0" (19%). A 90.5% considered the usefulness in the analgesic therapeutic arsenal to be 'Essential or highly recommended'.

Side effects were infrequent (nausea and dizziness) and there were no cases of respiratory depression. It has been used in patients with comorbidities such as obesity, heart disease, respiratory, renal and hepatic insufficiency.

Inadequate control of severe pain is associated with delayed ambulation, higher rates of complications, longer postoperative stay and higher risk of developing chronic postoperative pain. SST30 shows clear advantages as a new alternative in the therapeutic arsenal, facilitating the individualization of treatment according to the needs of each patient.

Conclusion(s): Sublingual sufentanil 30 ug, due to its route of administration and pharmacokinetic profile, has proven to be an effective and safe opioid analgesic in the management of postoperative acute pain of moderate to severe intensity, being of special interest in procedures with difficult pain control.

Neuropsychiatric symptoms induced by intrathecal ziconotide: case reports

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Background: Ziconotide is the only non-opioid analgesic approved by the FDA and EMA for the intrathecal treatment of refractory chronic pain. It blocks N-type calcium channels located in the dorsal horn of the spinal cord. The recommended initial dose is 0.5 to 1.2mcg/day, with weekly increases of 0.5 to 1.0 mcg/day up to a maximum of 19.2mcg/day. Neuropsychiatric symptoms are the most significant adverse effects, often necessitating dose reduction or discontinuation.

Case Report: A 52-year-old woman with a history of malignant pleural mesothelioma and mixed pain in the left T7-10 dermatomes. After implanting an intrathecal morphine pump, ziconotide was added at 1.31mcg/day and titrated to 7.5mcg/day over 11 months, improving pain. However, she developed confusion, auditory hallucinations and delusional persecution. Ziconotide was reduced by 20% and discontinued within 48 hours. Symptoms resolving after 72 hours.

A 68-year-old man with hypertension and severe traumatic brain injury causing cervical myelopathy and paraplegia. He experienced diffuse central neuropathic pain in the thorax and upper limbs. An intrathecal ziconotide pump (1.2mcg/day) was implanted, later combined with baclofen. Ziconotide was titrated over 22 months to 4.02mcg/day with pain relief, but led to somnolence and somatic delusions. Ziconotide was reduced by 25% over one week and then discontinued, resolving psychosis.

A 53-year-old woman with complex regional pain syndrome in the right arm after elbow surgery. An intrathecal morphine infusion pump combined with bupivacaine was implanted. Ziconotide was later introduced as a second adjuvant at 0.6mcg/day, titrated over one year to 6.3mcg/day. She developed auditory hallucinations, persecutory delusions and suicidal ideation. Symptoms subsided following antipsychotic therapy and gradual withdrawal (three weeks) of ziconotide.

Discussion: Intrathecal ziconotide effectively controls refractory chronic pain both as monotherapy and in combination but poses significant neuropsychiatric risks, even with recommended dose and titration. Patient profiles and neuropsychiatric presentations were heterogeneous. Many times, symptom resolution required drug discontinuation.

References:

DOI: 10.1016/j.heliyon.2024.e31105 DOI: 10.3389/fnmol.2024.141285

Learning points: Intrathecal ziconotide is a powerful analgesic but it is necessary to investigate new strategies that prevent and treat the neuropsychiatric symptoms.

25AP03-8

Multimodal management of postoperative pain control in Total Knee Replacement (TKR). Implementation of a protocol

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Background and Goal of Study: Managing postoperative Total Knee Replacement pain remains a major challenge, impacting both clinical recovery and patient satisfaction. TKR pain management protocols vary widely with no current consensus. These strategies aim to optimize pain control while minimizing side effects. They incorporate a range of methods, including nerve blocks, non-opioid analgesics, opioids, and non-pharmacologic techniques such as physical therapy.

However, evidence regarding the efficacy and optimal combinations of these interventions varies widely across studies. The purpose of our study was to present our pain management model, and the preliminary results of its application.

Materials and Methods: The analgesic protocol included:

- 1. Ultrasound-guided Femoral nerve block (single injection): Ropivacaine 0.5%, 20ml plus Dexamethasone 4 mg.
- 2. Single Local Infiltration Analgesia(LIA) (Ropivacaine 0.2%. 80 ml plus Adrenaline administered after bone preparation and before definitive implantation: Inject 40 ml in the posterior capsule and after definitive implantation of the components: 20 ml in the knee extensor apparatus and 20 ml for surgical wound infiltration. The analgesia protocol in the recovery room and on the ward based on the visual analogue scale (VAS).

Mild to moderate pain: Dexketoprofen alternate with Paracetamol. VAS greater than 4: Morphine

Results and Discussion: FNB and LIA with oral medication provided effective analgesia for TKR surgery and reduced the amount of perioperative opioid administration without adverse effects. This analgesia provided improvement in the patient's comfort and satisfaction.

Conclusion(s): Perioperative pain management in patients undergoing TKR is important to improve patient satisfaction, and rehabilitation. Multimodal analgesia should be the best analgesic regimen for this patients.

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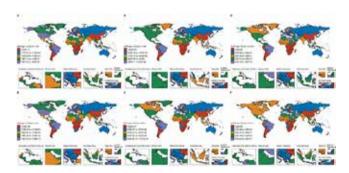
Global, regional and national burden of migraine among children and adolescent, 1990-2021: evidence from the Global Burden of Disease **Study 2021**

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Background and Goal of Study: The burden of migraine is increasing and has become the leading neurological cause of disability among children and adolescents aged 5-19. We aim to provide updated epidemiological evidence on the burden of migraine among children and adolescents to inform policy development and promote equitable healthcare management.

Materials and Methods: Using data from the Global Burden of Disease (GBD) Study 2021, we estimated the age-standardized incidence rate (ASIR), prevalence rate (ASPR), and disabilityadjusted life years (DALYs) rate (ASDR), with 95% uncertainty intervals. Stratifications were performed by age, sex, geographic region, sociodemographic index (SDI) quintiles, and nation.

Results and Discussion: In 2021, the global burden of migraine among children and adolescents was estimated at 6.64 million new cases compared to 1990, and a prevalence of 206 million cases (95% UI: 153-269 million). Over the past three decades, ASIR, ASPR, and ASDR for migraine have shown upward trends globally. Females exhibited higher ASIR, ASPR, and ASDR compared to males, although males demonstrated a steeper rate of increase. The highest ASPR and ASDR were observed in low- and middle-SDI countries, while ASIR was highest in high-SDI countries. The burden was particularly pronounced in tropical Latin America, with Brazil experiencing the greatest burden and presenting the largest potential for improvement. Countries with low SDI such as Haiti, Afghanistan, and Yemen, as well as high SDI countries like Belgium, Germany, and Norway, have been identified as having greater potential for improving migraine burden.



Conclusion(s): From 1990 to 2021, the incidence and prevalence of migraine among children and adolescents increased, with a particularly severe impact in low- and middle-SDI countries and tropical Latin America. Targeted public health policies are urgently needed to address these disparities, prioritize vulnerable populations, and advance healthcare equity globally.

25AP03-10

Inhibition of ZIP7 improves diabetic peripheral neuropathy by regulating oxidative stress

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Background and Goal of Study: Diabetic peripheral neuropathy (DPN) is the most common complication of T2DM. However, the underlying molecular mechanisms of diabetic neuropathic pain are still poorly understood. In recent years, the role of ZIP7 (zinc transporter, Slc39a7) in insulin resistance and T2DM has received widespread attention. However, there have been no reports on whether ZIP7 is involved in diabetic peripheral neuropathy.

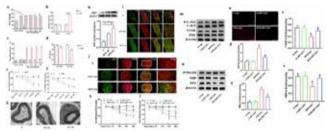
So, this study intends to explore the mechanism of ZIP7 on DPN, and provide new ideas for the treatment of clinical DPN.

Materials and Methods: A rat model of T2DM (DM group) was established by high-sugar and high-fat diet combined with intraperitoneal injection of STZ. Determine the model success. Rats in the DPN 14d and 21d group were randomly selected and sacrificed for ZIP7 and S100β IF staining, ZIP7 mRNA and protein expression. 4 weeks before STZ injection, ZIP7 adenovirus (DPN+ZIP7-AVV group) was injected in sciatic nerve, and the paw mechanical threshold (PWT) and thermal latency (PWL) were measured.

The myelin sheath structure of the sciatic nerve were observed and the expression of ERK, P-ERK, C-JUN, P-C-JUN, MPZ, MBP, and P75NGFR were measured.

Results and Discussion: The body weight was decreased, insulin sensitivity, fasting blood glucose of the DM group increased, and the sciatic nerve transmission rate slowed down, PWT and PWL of the DPN 21d decreased. The myelin sheath of sciatic nerve Schwann cells in DPN 28 group was observed to be loose and destroyed. ZIP7 and S100\beta co-localized in sciatic nerve, and ZIP7 expression increased at 21 days of DPN.

Compared with the DPN group, PWT increased and PWL prolonged in the DPN+ZIP7-AVV group, the sciatic nerve transmission rate was accelerated. And an increase of MBP and MPZ expression, a decrease of p-ERK, p-C-JUN expression, an increase in ROS and MDA production, and a decrease of T-AOC and GSH were observed in DPN+ZIP7-AVV group.



Conclusion(s): Inhibition of ZIP7 expression can improve DPN myelin damage by inhibiting Schwann cell dedifferentiation and mitigate the development of DPN by inhibiting mitochondrial oxidative stress.

Use of DiscoGel® for the treatment of lumbosciatica: case series

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Background: Low back pain has an incidence in the general population between 60-90%, of which between 5-40% will radiate to a lower extremity, constituting the condition of sciatica. The causes of this are diverse, with intervertebral disc herniation being the most common etiology (85%) [1].

In the Spanish population, up to 40% of cases require invasive management or surgery.

Currently, DiscoGel® is presented as a non-invasive method for the treatment of symptomatic disc herniation that promises a high success rate.

Case Report: We present a series of cases from our unit in which DiscoGel® was used as a treatment for herniated disc. In all of them, maximum pharmacological treatment was reached and epidural infiltrations with corticoesteroids and local anesthetic were performed, without result.

Discussion: DiscoGel® shows a results rate that is considered very good or good for 91.4% of respondents.

For the effectiveness rate to be high, it is important to properly select the type of hernia on which to use DiscoGel®. The ideal case. it would be a contained hernia, small to medium in size, occupying less than half the diameter of the canal on MRI, with failure of conservative treatment for 4-6 weeks, combined with at least one corticosteroid infiltration [2] [3].

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Learning Points: 3 of the 4 patients treated in our case series had a VAS < or = 3; 3 months after the procedure, and were considered satisfied.

1 of the 4 treated patients had a VAS of 7 at 3 months. He was probably not well selected for the technique. He was the only one who needed subsequent surgery. It was carried without complications thanks to the fact Discogel does not alter the anatomy. A larger sample size, greater technical experience, and longer follow-up are necessary to continue studying the results in our unit.

25AP04-2

Comparison of analgesic efficacy of tramadol, petidine and morphine in the treatment of pain after elective thoracic surgery under the Erector Spina Plan (ESP) block: preliminary results

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Background and Goal of Study: Thoracotomy is commonly used but painful procedure in lung surgeries, with prevalence of postthoracotomy pain syndrome ranging from 33% to 91%. Postoperative pain can hinder effective coughing, leading to atelectasis, hypoxemia, and complications. Effective pain management reduces complications and accelerates recovery.

The aim of this study is to compare the analgesic efficacy of tramadol (T), pethidine (P), morphine (M) under ESP block and to monitor their effectiveness using the Analgesic Nociceptor Index (ANI).

Materials and Methods: A single-center, prospective, RCT was conducted between 10/2023-11/2024, involving 50 patients who underwent elective thoracic surgery. After obtaining informed consent, patients were randomly assigned to 3 opioid groups.

In OR, ASA monitoring was applied and ESP block was applied for pain management. Group T received 1 mg/kg loading dose followed by T-PCA. Group M received 0.1 mg/kg loading dose followed by M-PCA. Group P received 1 mg/kg loading dose followed by P-PCA. After ICU admission, ANI monitoring was applied, values were recorded for 48 h.

In the postoperative period, VAS, RASS, PONV, opioid consumption and need for additional analgesics/antiemetics were monitored. Extra analgesics- antiemetics were administered if VAS>4 or PONV >2. Side effects, such as respiratory depression, constipation were recorded.

Results and Discussion: There was no significant difference in intraoperative-postoperative hemodynamic parameters, VAS, PONV, ANI. Opioid consumptions, need for additional analgesic/ antiemetic were similar. A significant difference was found in the RASS (Richmond Agitation Sedation Scale) scores at 12 hours postoperatively (p=0.006).4/14 patients in group T had RASS -1(28.6%), while no patients in group P exhibited this state. For RASS 0, Group P and Group M showed similar results, but there was a significant difference when compared with Group T.

Specifically, 8/14 patients in Group T had RASS 0, while all 15 patients in Group P and 16/18 patients in Group M had RASS 0(88.9%). No significant differences in RASS 1-2 scores between 3 groups.

Conclusion(s): This study is the first to compare 3 opioid groups under ESP block in thoracic surgery. While ANI is more commonly used in intubated patients, there are few studies on its use in awake patients.

In this preliminary analysis, due to its correlation with nociception, ANI may serve as an early indicator for effective pain management before VAS scores increase.

25AP04-3

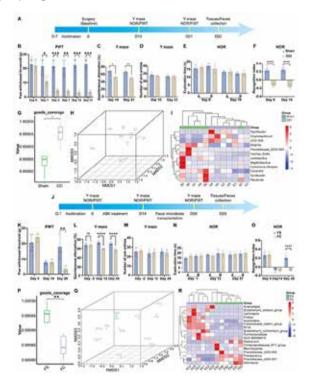
Spatial metabolomics combined with 16S RNA sequencing revealed the effect of gut microbiota on different brain regions in rats with chronic pain-induced cognitive dysfunction

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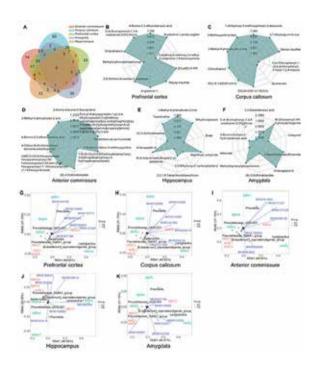
Background and Goal of Study: Under the long-term distress of chronic pain, some patients will have cognitive dysfunction. Gut microbiota was found to be involved in the development of neuropsychiatric disorders.

Materials and Methods: Rats were divided into experimental group with chronic constriction injury (CCI group) and control group (Sham group). Fecal samples were collected on day 21 for 16S RNA sequencing and fecal microbiota transplantation (FMT). The pseudo-sterile rats were transplanted with feces from the CCI and Sham groups, named FC and FS groups accordingly. After FMT, feces from both groups were collected for 16S RNA sequencing, and brain tissues were collected for spatial metabolomics. The metabolite were analyzed in prefrontal cortex, corpus callosum, anterior commissure, hippocampus, and amygdala.

Results and Discussion: 16S RNA sequencing results showed that compared with the Sham group, the structure of gut microbiota in the CCI group was changed. After FMT, rats in the FC group showed decreased pain threshold and impaired cognitive function compared with the FS group. 16S RNA sequencing results showed that there was a significant difference in the composition and structure of gut microbiota between the FS group and the FC group (Figure 1).



Spatial metabolomics showed that after FMT, the levels of metabolites in the prefrontal cortex, corpus callosum, anterior commissure, hippocampus, and amygdala in the FS group and FC group were significantly changed. Unexpectedly, the altered metabolites were different among the five brain region (Figure 2).



Conclusion(s): Gut microbiota was involved in the occurrence and development of chronic pain combined with cognitive dysfunction, and it has different effects on metabolites in different brain regions of the host.

25AP04-4

Intraoperative continuous esmolol infusion for perioperative opioid and postoperative pain reduction: a systematic review of randomized controlled trials, meta-analysis and metaregression

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Background and Goal of Study: This meta-analysis evaluated the perioperative analgesic efficacy of intraoperative continuous esmolol infusion (ICEI) compared to placebo in various surgical settings. Given the limitations of previous meta-analyses and the need for opioid alternatives, this study aimed to provide updated evidence.

Materials and Methods: PubMed, Embase, and Cochrane databases were systematically searched using terms related to esmolol. Primary outcomes were postoperative opioid consumption(POC), pain scores, and intraoperative morphine equivalent(ME) requirements. Meta-regression analysis explored correlations between patient ages, surgical complexity, and analgesic outcomes. Effect sizes were summarized as mean differences (MD) with 95% confidence intervals (CI). Statistical analyses were performed using R version 4.X.X

Results and Discussion: A broad search strategy found 641 records. Of the 32 studies screened, 18 RCTs were included, totaling 968 patients (ICEI n=485; control n=483). ICEI significantly reduced POC (MD = -3.07 mg; 95% CI -40.62 to -5.72; I² = 95.4%; p < 0.001) and intraoperative ME (MD = -21.97 mg; 95% CI -40.62 to -3.33; $I^2 = 99.5\%$; p < 0.001). Pain scores were also lower in the ICEI group (MD = -1.43: 95% CI -2.09 to -0.76: I^2 = 98.7%: p < 0.001). Meta-regression indicated a significant association between younger age and reduced POC (p < 0.0438) and between higher surgical complexity and intraoperative analgesic use (p < 0.0001).

Conclusion(s): Esmolol reduces opioid consumption and pain scores when comparated with placebo.

25AP04-5

Quadratus lumborum and piriformis muscle infiltration, a new approach for low back pain in pregnant patients: case reports

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Background: Low back pain (LBP) is a common issue in pregnancy. Postural changes from abdominal and breast enlargement increase lumbar lordosis and paravertebral muscle tension. Weight gain also strains gluteal muscles and the piriformis, potencially compressing the sciatic nerve. This condition impacts physical, social, and economic well-being, with persistent pain in 10% of cases lasting up to 2 years. We report 2 cases of pregnant women with LBP refractory to non-invasive measures.

Case Report: Patient A. a 33-year-old, at 27 weeks' gestation. presented a 4-month history of LBP. The pain, rated 8/10, radiated from her left lower back pain to the left foot, unresponsive to physical therapy and opioid analgesics. Examination revealed tenderness over the left paravertebral trigger points without sacroiliac joint involvement.

Patient B, a 26-year-old obese woman, at 24 weeks' gestation, was admitted for refractory pain following treated renal colic. In this case, the LBP radiated from her right lower back pain to her posterior thigh and only partially improved with optimized medical

In both cases, following informed consent, an ultrasound-guided injection was performed, administering a combination of levobupivacaine and betamethasone into the quadratus lumborum and piriformis muscles.

Patient A reported significant improvement four hours after the procedure, with complete pain resolution by one month, maintaining pain relief until after delivery.

On patient B, the technique resulted in immediate pain relief, with her being discharged three days later, reporting complete resolution of pain.

Discussion: Chronic pain treatment during pregnancy can be challenging due to generalized concerns about analgesic drug use, putting pregnant women at risk of undertreatment. For instance, non-steroidal anti-inflammatory use after 28 weeks of gestation comprises risk of premature ductus arteriosus closure, while opioid use poses potential risks to fetal development and may lead to fetal opioid dependency. A multimodal management of LBP is recommended for optimizing outcomes in pregnant patients. In this case, we suggest an alternative strategyinvolving the targeted infiltration of local anesthetic and corticosteroid into the fascial planes compressing the sciatic nerve.

Learning points: We believe this approach has the potential to provide effective and lasting analgesia for pregnant patients with radicular pain while minimizing side effects.

25AP04-7

The effect of the music therapy model "The **Bonny Method of Guided Imagery and Music** (GIM)" in patients with rheumatoid arthritis and chronic pain. Results of a randomized controlled

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Background and Goal of Study: Current literature suggests that music therapy can alleviate chronic pain through a pleasurable aesthetic experience. We aimed to assess the effect of the music therapy model "The Bonny Method of Guided Imagery and Music (GIM)" on chronic pain in patients with rheumatoid arthritis (RA). Materials and Methods: This prospective randomized trial (NCT04380129) included adult patients with chronic pain due to RA, who were referred to our Outpatient Pain Clinic.

After informed consent, participants were randomized (electronically) either in music therapy-conversation sessions (GIM group) or in music listening only (control group). "Intervention" was defined as "a weekly session of listening to Helen Bonny's Caring program for 4 weeks".

At the beginning of the 1st session and 1 week after the 4th session the Wong-Baker Face Scale Pain Rating Scale (WBS) and the painDETECT questionnaire (PD-Q) were applied. WBS assesses pain with a simultaneous visual, numeric and functional analogue display. PD-Q is a screening tool for neuropathic pain (NP). According to power analysis 33 participants per group were required to improve pain more than 2 points on the WBS scale (probability of 90%).

To counteract for dropouts 37 participants per group were recruited. Linear regression models were used to investigate the statistical significance of the applied therapy on pain. Tests were two-tailed and statistical significance was established at 5% (p<0.05). Data were analyzed using Stata ™ (Version 10.1 MP, Stata Corporation, College Station, TX 77845, USA).

Results and Discussion: Seventy-four patients (37 per group) were included. Groups were homogenous concerning demographical characteristics. According to WBS baseline pain did not differ between GIM and control group (5.89 vs 6.24, p=0.488) before intervention.

However, based on PD-Q baseline NP score differ between GIM and control group (23 vs 26, p=0.033). At the end of intervention WBS was significantly lower in the GIM group compared to controls (-2.3, p<0.001). Moreover, at the end of intervention NP, according to PD-Q, was significantly lower (p<0.001) in the GIM

Conclusion(s): Based on the results of our study, it seems that "GIM" model of music therapy has the potential to lower the pain scores of patients suffering from RA.

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25AP04-8

Effect of sphenopalatine ganglion blockage for postoperative pain control in tonsillectomies

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Background: Tonsillectomy is a highly prevalent surgical procedure in adults and children. For anesthesiologists and otolarvngologists, management of tonsillectomies postoperative (PO) pain has always been challenging. Many of these patients have sleep-disordered breathing or obstructive sleep apnea, making them particularly susceptible to respiratory depression. Requiring the use of opioids, the likelihood of laryngospasm and airway edema increases, which can intensify the respiratory depressive effects. The use of nonsteroidal anti-inflammatory drugs is still debated due to concerns about PO bleeding.

The objective of this report is to demonstrate a new alternative for PO pain control in tonsillectomies.

Case Report: A 32-year-old patient, ASA 3, body mass index 48 and severe sleep apnea submitted to tonsillectomie and sinusectomy. After the procedure, he developed an intense pain (9/10 in the VAS).

After obtaining his consent, we performed a bilateral sphenopalatine ganglion blockage (SPGB). SPGB was performed with 2 cotton swabs soaked into 1ml of Ropivacaine 0,75%. The patient reported important and immediate pain relief (5/10).

Two hours after he reported 1/10 pain and was able to eat a liquid diet normally. He was contacted the next seven days and reported no pain in home.

Discussion: Despite advances in anesthesiology and otolaryngology equipment and techniques, PO pain in tonsillectomy is still a persistent problem. SPGB has attracted the interest of practitioners treating a lot of pain for over a century. Sluder had described the first recorded instance of a remote dysfunction arrested by anesthetization of the SPG in 1903. In 1930 Byrd described observations that have accumulated in the literature on the SPG during the past twenty-five years.

Over the years, this simple and valuable technique has been ignored. When studying SPGB, trends show good results in endoscopic sinus surgeries. However, there is a lack of studies that correlate blockade with tonsillectomy surgery in adults.

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Learning points: The SPGB significantly reduced PO pain

25AP04-10

The impact of language used prior to the insertion of intravenous cannula on patient experience

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Background and Goal of Study: The use of language can impact the patient experience of pain and discomfort. Nocebo language is a negative suggestion that can cause undesirable effects, such as pain or discomfort. A procedure that is often associated with the used of nocebo language is the insertion of an intravenous cannula, with phrases such as 'sharp scratch' commonly associated with this procedure1.

The nocebo effect is becoming more appreciated, and it is hoped that improved knowledge will have an impact on the use of language. An observational study involving patient questionnaires to see what patients recalled as the intravenous cannula was inserted, level of pain or discomfort they recalled was conducted. The actual words/phrases used were not recorded.

Materials and Methods: Thirteen patients who had a cannula consented to take part in a questionnaire. They were in different locations across the hospital including the Emergency Department (4 patients), Clinical Assessment Units (5) and Day Surgery Units (4).

Patients were asked if they recalled what was said before the cannula was inserted, and then to rate both pain and discomfort scores using a numerical and verbal rating. The data was analysed by pain and discomfort scores in relation to the type of lan-

Results and Discussion: The results were divided into three groups - one that used distraction or neutral techniques (3), a group using phrases with negative connotations (3) and a third group who reported they didn't recall what was said (7).

Pain scores for each group were similar, but discomfort comfort scores were lower in the nocebo group. Most interestingly, the patient who recalled being told that it wouldn't hurt did not report any pain or discomfort.

Conclusion(s): This study does not show significant difference in the interpretation of pain during the insertion of a cannula. The context of the situation may influence their cannulation experience as some patients had been unwell when the cannula was inserted.

Overall, most people did not perceive this procedure as painful, despite the language that they recalled being used however there are cases where patients have specific concerns such as needle phobia which should be considered.

Reference:

Arrow K, Burgoyne L, Cyna AM Implications of nocebo in anaesthesia care Anaesthesia 2022 77 S1 11-20

25AP04-11

The sphenopalatine ganglion block in the treatment of postdural puncture headache: serie of cases

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Background: Management of post-dural puncture headache (PDPH) has always been a challenge for anesthesiologists. Supportive therapy with symptomatic medications is the initial approach in patients with mild PDPH. Epidural blood patch (EBP) is the gold standard procedure when supportive therapy fails or in cases with severe manifestations. However, it is not a risk-free procedure. Sphenopalatine ganglion block (SPGB) has long been used to treat headaches of different etiologies, and has been suggested as an alternative for the treatment of PDPH.

Case Report: A serie of 52 cases that occurred in 16 months, at the same service in Belo Horizonte, Brazil, will be presented. Of the 52 blocks, 8 occured in patients with PDPH after inadvertent puncture of the dura mater in an epidural attempt. 1 patient underwent prophylactic block, after inadvertent puncture. 43 cases of PDPH occured after spinal anesthesia with a Quinck needle. Of the 8 post-epidural patients, 7 reported satisfactory improvement (decrease of at least 4 points on the pain visual scale). Of the 43 patients after spinal anesthesia, 40 reported a satisfactory improvement.

The patient who underwent prophylactic blockade intraoperatively, after inadvertent perforation, was followed up for 7 days and did not develop headaches or other complaints. 3 patients developed complications possibly associated with SPGB.

In one patient, despite the improvement of headache, there was worsening of diplopia and photophobia. In the other two patients in which SPGB was performed, it occurred an important improvement of pain, however, they evolved with seizures and cerebral venous thrombosis was diagnosed.

Discussion: Some authors state that this is a safe technique and reported successful cases. This treatment proved to be effective in improving headaches, but it does not affect its probable etiology. It may be associated with complications as liquoric hypotension, cerebral venous thrombosis and cranial nerve traction. Anesthesiologists consulted to perform SPGB must always be aware of differential diagnoses and possible variations in PDPH presentations.

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Learning points: SPGB is a reliable alternative for treatment of CPPD.

25AP04-12

Determination of postoperative pain intensity in difficult laparoscopic cholecystectomy surgeries

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Background and Goal of Study: In current practice, laparoscopic cholecystectomy (LC) has become the preferred choice for the treatment of cholelithiasis due to its advantages such as postoperative patient comfort, rapid wound healing, early oral intake, low complication rates, and early discharge. While recommendations for postoperative analgesia following LC are clearly defined, there are no specific guidelines or studies in the literature regarding analgesia for difficult LC cases.

Our study aims to compare the postoperative pain levels between uncomplicated LC and difficult LC cases, and to identify the risk factors influencing postoperative pain.

Materials and Methods: Patients aged 18-80 years with ASA physical status I-II were included in our study. All patients received 4 mL of 0.5% bupivacaine injected into 5 mm trocar sites and 6 mL into 10 mm trocar sites before incision. Insufflation pressure for pneumoperitoneum was set at 10-12 mmHg.

After anesthesia induction, all patients received 8 mg dexamethasone. Thirty minutes before the end of surgery, 1 g paracetamol and 50 mg dexketoprofen were administered as postoperative analgesics. Laparoscopic difficulty was determined according to the Nassar classification.

Patients' NRS scores were evaluated at postoperative 1, 5, 10, 15, and 20 minutes, as well as at 2, 4, 6, 8, 12, 18, and 24 hours. Additionally, pain assessments were conducted using the short form McGill pain scale at 6 and 24 hours.

Results and Discussion: NRS-PACU values were 2.8 (2.4-4) for the easy LC group and 3 (2.35-4.05)

for the difficult LC group (p=0.491). NRS 24-hour follow-up values were 2.1 (1.7-2.6) for the easy LC group and 1.95 (1.3-2.32) for the difficult LC group (p=0.08). There was no significant difference observed in pain levels between the two groups.

Conclusion(s): Our study concluded that difficult LC surgery is not directly associated with higher pain intensity.

25AP05-1

Postoperative neuropathic pain after knee arthroplasty: The role of transitional pain medicine

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Background: Neurological complications in surgery/anesthesia present challenges in postoperative recovery. Acute pain, specifically neuropathic pain, may persist after surgery, complicating recovery and potentially leading to chronic pain. Effective management prevents long-term disability and enhances outcomes.

Transitional Pain Medicine is key in bridging the gap between acute postoperative care and long-term pain management and reducing the risk for pain chronification.1

Case Report: Male, 70-year-old, ASA III, underwent right total knee arthroplasty under combined spinal-epidural anesthesia, with no complications. The patient remained stable during the intraoperative and immediate postoperative periods. He was discharged 3 days after surgery with adequate pain control.

At home, he developed severe neuropathic pain in the right lower limb (burning pain and cold dysesthesia), from the foot to the inguinal region (L1-S2 dermatomes).

He experienced allodynia and hypoesthesia on the lateral side of the knee, without motor or sphincter dysfunction or symptoms in the contralateral limb.

He was prescribed gabapentin, alpha-lipoic acid supplement, tapentadol, tramadol+paracetamol combination, duloxetine, and metamizole, and referred to the Transition Pain Clinic.

Electromyography revealed sensitive axonal polyneuropathy in both lower limbs. Lumbar CT showed degenerative changes not correlated with the symptoms.

The patient was followed for 7 months, gradually reduced pain medication, and initiated physical therapy. Neuropathic pain symptoms were resolved at discharge.

Discussion: This case highlights the importance of early intervention and specialized care in managing postoperative neuropathic pain.2

This comprehensive approach led to a favorable outcome, emphasizing the tole of Transition Pain Medicine in contemporary pain management.

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Learning points: Transition Pain Medicine helps ensuring appropriate follow-up and preventing pain chronification, particularly in patients with risk factors.

25AP05-2

The effect of different background doses of oliceridine PCIA following bone tumor excision: a prospective double-blind randomized controlled trial

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Background and Goal of Study: Oliceridine, a novel G proteinbiased µ-opioid receptor agonist, is designed for managing acute moderate to severe pain in adults, aiming to offer safer analgesic

This study sought to compare the comprehensive effects of traditional opioid sufentanil and different background doses of oliceridine in patient-controlled intravenous analgesia (PCIA) following bone tumor resection, and to explore the appropriate analgesic regimen of oliceridine.

Materials and Methods: This prospective, randomized controlled trial enrolled 99 patients who underwent elective bone tumor resection under general anesthesia. Participants were randomly assigned into four groups. The control group (Group S) received sufentanil with a PCA dose of 0.04 µg/kg, a lockout interval of 15 minutes, and a background infusion rate of 0.04 µg/kg/h. The experimental group (Group O) received oliceridine with a PCA dose of 0.35 mg and a lockout interval of 6 minutes. Group O was further divided into three subgroups based on the background infusion rates: Group O1 (0 mg/h), Group O2 (0.2 mg/h), and Group O3 (0.4 mg/h). The primary outcome was the 48-hour postoperative activity NRS scores.

Secondary endpoints included resting NRS and Ramsay sedation scores, usage of analgesic pump, rescue situations, adverse events, and patient recovery indicators within 48 hours postop-

Results and Discussion: Significant differences were observed in the 48-h postoperative activity NRS scores among the four groups (P<0.05). Compared to Group O1, in the groups receiving background infusions, activity NRS scores were substantially reduced, with a notably diminished number of PCA compressions. Whereas, analgesic consumption in Group S and O3 was greater than in Group O1(P<0.001).

Compared to Group S, nausea and vomiting were less frequent in Groups O (P<0.05). Additionally, Group O2 demonstrated markedly higher postoperative satisfaction scores and superior recovery indicators than the other three groups (P<0.05).

No statistically significant differences were noted in resting NRS scores, the need for rescue analgesia, or the incidence of other opioid-related adverse events among the four groups (P>0.05).

Conclusion(s): Oliceridine can be safely and effectively utilized for postoperative analgesia in orthopedic patients, providing analgesic efficacy comparable to sufentanil, with a significantly reduced incidence of adverse effects.

A background infusion of 0.2 mg/h offers the optimal balance by reducing opioid consumption, minimizing opioid-related adverse effects, enhancing patient satisfaction, and promoting early postoperative recovery, while maintaining effective analgesia.

25AP05-3

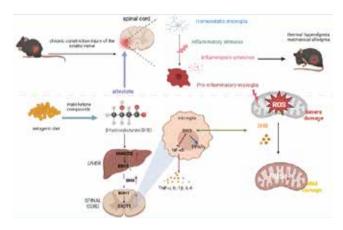
SIRT3 is required for the protective function of ketogenic diet on neural inflammation and neuropathic pain

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Chronic neural inflammation is the key pathology of neuropathic pain. The ketogenic diet (KD) has been shown to reduce neural inflammation and hyperexcitability in Alzheimer's disease. However, the function and mechanism of KD in neuropathic pain remains unclear.

In this study, we first found that the KD production was decreased upon neuropathic pain induced by chronic constriction injury (CCI). Then we demonstrated that KD effectively alleviated CCI-induced thermal hyperalgesia and mechanical allodynia and relieved neuroinflammation by reducing microglia activation and pro-inflammatory cytokines. β-hydroxybutyrate (BHB), a major component of KD, reduced ROS production by enhancing mitochondrial membrane potential in microglia, thereby decreasing microglia-induced inflammatory responses. In vivo and in vitro experiments revealed that the expression of UCP2. SIRT3 and PGC-1α expression in the spinal dorsal horn was increased by KD. SIRT3-deficiency abolished the protective function of KD on neuropathic pain.



Additionally, SIRT3 deficiency decreased BHB production due to the reduced expression of ketone body synthases in the liver and ketone body-utilizing enzymes in the spinal dorsal horn. These findings suggest that SIRT3 is a promising therapeutic target for neuropathic pain, particularly in the context of a ketogenic diet, which may inspire novel therapeutic strategies.

25AP05-4

Evaluation of a machine learning score based on electrocardiographic activities to predict pain during a virtual reality hypnosis session in healthy volunteers

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Background and Goal of Study: Clinical gold standard pain assessment is based on subjective methods (visual analogue or numerical scale (VAS)) in case of an awake, fully oriented patient. Automated pain detection from physiological data offers objective insights, especially for sedated patients to better standardize pain assessment. Research on machine learning for pain assessment shows promising results (1).

We choose Electrocardiographic (ECG) data to predict pain in awake, healthy adults during a virtual reality hypnosis (VRH) session (HypnoVR Biofeedback®), using heart rate and heart rate variability (HRV) features to assess sympathetic-parasympathetic balance (2,3).

This study aimed to evaluate a machine learning-based score using ECG activities to predict pain in awake adults.

Materials and Methods: We collected ECG data (BIOPAC or Faros®) from 98 subjects using a VRH during 3 experiments:

- 1, 20 acute heat stimulations and 10 temperature ramps.
- 2. Cold stimuli of increasing intensities.
- 3. Hot and cold stimuli.

We selected 51 subjects who reported a VAS > 3.5. We computed all features over 2-minute sliding windows, with pain stimuli as target variables within that window.

We extracted HR, and time- and frequency-based HRV components as features and trained five XGBoost classifiers. The mean predictive probability of the ensemble served as the pain indication (termed comfort score) where values <0.5 indicate pain.

The dataset was split subject-wise into train and evaluate sets, with 40 subjects for training and 11 for evaluation. We used 5-fold cross-validation within the training set. The test set was used for reporting the score to prevent data leakage.

Additionally, we acquired another set from 22 subjects using VRH during heat stimulation for testing the score.

Results and Discussion: For our balanced non-overlapping test set, we achieved an area under the receiver operating characteristic (AUROC) of 0.68. With a threshold set at 0.5, we detected 66% of records where VAS > 3.5 was induced. We used a VAS threshold of 3.5 to distinguish pain from no pain conditions, considering it before treatment and to try to detect low pain as a start of discomfort.

The additional evaluation set (54.5% women, mean age 28 ± 9.6 years, mean postgraduate education 3.5 ± 2 years) showed that the computed score was <0.5 during the stimulation period for 77% of pain intensity and 88% of pain unpleasantness cases.

Conclusion(s): In this cohort, the comfort score based on machine learning showed good discriminatory capacity for VAS>3.5 in healthy volunteers. Multimodal approaches for automatic pain estimation, especially in clinical settings, show significant improvements when the temporal aspects of the modalities is in-

However, there are limitations in the available public pain databases for optimally supporting deep machine learning model development, validation, and application as decision-support tools in real-life scenarios.

Further studies on patients are needed to validate the effectiveness of pain score based on ECG activities.

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25AP05-5

Exploring genetic contributions to chronic post-surgical pain: insights from GWAS

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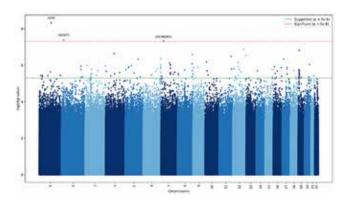
Background: Chronic post-surgical pain (CPSP) affects numerous patients, reducing their quality of life and increasing healthcare demands. While surgical and psychological factors are recognized as risks, the genetic basis in CPSP remains unclear.

This study investigates genetic variations associated with CPSP and aims to develop predictive models for personalized pain man-

Methods: We used the UK Biobank dataset, including genetic and clinical data from participants who underwent major surgeries. Cases were participants with chronic pain after surgery, while controls had similar surgeries but no chronic pain. Quality control ensured sex concordance, limited population substructure to White British participants, and excluded related individuals, Genome-wide association studies (GWAS) were conducted to identify genetic variants associated with CPSP. Clinical factors- age, sex, smoking, alcohol use, and depression history-were analyzed and stratified by group.

Results: Baseline characteristics are summarized in Table 1. Preliminary GWAS analysis identified several loci meeting suggestive (p<5×10-6) and genome-wide significance (p<5×10-8) thresholds, as shown in Figure 1. Three genes (ACP6, HS1BP3, and LOC402641) showed significant variant frequency differences between cases and controls suggesting their role in CPSP pathophysiology.

Feature	Category	Cases	%	Controls	%	P-value
Sex	Male	1,399	57.36	18,764	57.69	0.77
	Female	1,040	42.64	13,762	42.31	
Year of Birth		1950.19		1950.19		1.00
(Mean ± SD)		± 7.42		± 7.48		
Ever Smoked	Yes	1,524	62.48	20,386	62.68	
	No	906	37.15	12,078	37.13	1.00
	No	9	0.47	62	0.19	
	Information					
History of Sadness or	Yes	959	39.32	12,762	39.24	
Depression	No	687	28.17	9,342	28.72	
•	No	793	32.51	10,422	32.04	0.92
	Information					0.32
Reported Concern from	Yes	154	6.32	2,091	6.43	
Others About Alcohol Use	No	1,469	60.23	19,745	60.71	1.00
	No	816	33.45	10,690	32.86	
	Information					
Total		2,439		32,526		



Conclusion: Our findings demonstrate the potential of genetic data to predict CPSP risk. Understanding these variants may reveal mechanisms underlying chronic pain, particularly after trauma and surgery. Further research should focus on validating these results, developing polygenic risk scores, integrating phenotypic data, and testing models in diverse populations.

Acknowledgments: This research has been conducted using the UK Biobank Resource under Application Number 164591.

25AP05-7

The effect of the use of NMDA antagonists on the reduction of postoperative pain

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Background and Goal of Study: Pain is a complex entity with a harmful effect on the whole organism. The aim of the study is to examine the impact of preemptive administration of a bolus dose of ketamine and continuous infusion of ketamine and a bolus dose of magnesium sulfate on reducing the intensity of postoperative pain after laparoscopic operations for colon tumors.

Materials and Methods: A prospective study was conducted in 60 patients undergoing elective laparoscopic tumor surgeries. Patients were classified into one of three groups using simple randomization: ketamine-magnesium group (KM), magnesiumketamine group (MK), control group (C).

After introduction to anesthesia, patients in the KM group first received an intravenous bolus dose of 0,5 mg/kg ketamine, and then a continuous infusion of 0,6 mg/kg/h until near the end of the operation, after the bolus dose of ketamine they received magnesium sulfate 20 mg/kg in i.v. infusion (5-10 minutes).

Group MK received magnesium sulfate 20 mg/kg in i.v. infusion (5-10 min) and then ketamine in bolus and i.v. infusion in the same doses and in the same way as the KM group.

Group C received an infusion of 0.9% NaCl instead of ketamine or magnesium solution. Pain was assessed by reading the VAS scale. A VAS above 4 was determined for the administration of the analgesic ketorolac 30 mg, if after an hour the VAS was still above 4, tramadol 100 mg was administered.

A comparison was made of the VAS score between the studied groups and the total consumption of tramadol and ketorolac 48 h after the surgery.

Results and Discussion: Group mean values of VAS differed (p <0,0005), there is a statistically significant influence of time. It was proven that the level of pain in the examined groups differed statistically (p = 0,0005), the lowest level of pain was in the KM group, slightly higher in the MK group and the highest in the C group.

The multivariate test of changes in VAS scores by examined groups showed a statistically significant difference between KM and C group (p <0,000), as well as between MK and C group (p <0,002).

Differences in the consumption of ketoprofen and tramadol showed high statistical significance (p < 0,002). The highest consumption was in the C group and the lowest in the KM group.

Conclusion(s): Preemptive administration of ketamine and magnesium sulfate reduces the intensity of pain upon awakening as well as the cumulative consumption of tramadol and ketoprofen.

25AP05-8 Adults' experiences of perioperative opioid use: a mixed-methods study

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Background: As clinical perioperative pain management recommendations evolve and focus on patient-centred approaches it becomes important to understand how adults perceive and experience opioid use. Our scoping review highlighted several perioperative factors influencing opioid use but also identified a gap in studies specific to European populations. We aim to explore adults' multifaceted experiences with perioperative pain management, particularly examining the biopsychosocial factors. This ongoing study is part of a European project Pain and Opioid After Surgery.

Methods: It utilises a sequential explanatory mixed-methods approach

Phase 1 A telephone survey is conducted 14 days after surgery employing the IPO-Q designed to evaluate various aspects of pain outcomes, the data are analysed using descriptive statistics to guide the subsequent phase

Phase 2 interviews are conducted 3 months postoperatively to understand perioperative experiences better. Interviews address topics: perceptions of postoperative pain, goals, SDM and communication with healthcare staff. The data is subjected to an inductive thematic analysis and deductively mapped to the Theoretical Domains Framework (TDF). Findings are integrated to produce a comprehensive synthesis.

Results in tables:

Phase 1 Findings	Value/Description
Total participants	114
Feelings of helplessness and anxiety postoperatively	>60% of participants reported feelings of helplessness and anxiety after surgery
Need for additional pain Rrlief	20% (n=23), with the majority being female (n=14)
Average age of participants	61 years (SD = 15.88)
Gender distribution	49% females (n=56), 51% males (n=58)
Mean worst pain score	6 (SD = 3; 95% CI: 5.5 to 6.5)
Mean satisfaction with postoperative pain management	8 (SD = 2; 95% CI: 7.8 to 8.7)
Preoperative chronic pain	46% (n=55) reported having chronic pain before surgery
Involvement in pain treatment decisions	75% (n=85) reported being involved in decisions about pain treatment
Involvement in decision-making (Elective Surgeries)	73% (n=77) of participants in elective surgeries were more involved in decisions about pain management
Statistical significance	A significant association between involvement in decision-making and satisfaction (p = 0.0)

Phase 2 Findings	Value/Description		
Number of interviews conducted	15		
Shared Decision-Making (SDM)	Many interviewees were unfamiliar with the concept of shared decision-making despite survey claims. This discrepancy raises questions about whether reported involvement truly reflects shared decision- making practices.		
Pain management perceptions	Most patients felt pain was adequately managed		
Concerns about opioid use	Concerns about opioid dependence and side effects (e.g., drowsiness, nausea) were commonly reported		
Factors influencing pain treatment experiences	Preoperative education, effective communication, and positive relationships with healthcare providers influenced pain management perceptions		

Conclusion: A deeper understanding of the psychological social and contextual factors influencing adults' experiences is anticipated through more thematic analysis to help develop strategies to optimise pain management, enhance satisfaction and promote more meaningful shared decision-making in clinical settings.

25AP05-9 Stellate ganglion block as a treatment for post-traumatic stress disorder: a case report

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Background: The reported incidence of posttraumatic stress disorder (PTSD) is increasing - in part, due to improved recognition, but also as a result of recent large-scale military and civilian traumatic events in the world as Russian invasion in Ukraine. Enduring a trauma and then having to relive it through nightmares, flashbacks, and anxiety attacks is a terrifying experience. In early October 2022, an international research group conducted a survey, according to which 25.9% of respondents from Ukraine had symptoms of "probable PTSD."

This case report demonstrate our successful treatment of acute symptoms of PTSD.

Case Report: A 36-year-old male was the victim of an military conflict (War) at Ukraine. He received mine-blast injury of the lower extremities.35 days he was on treatment at the hospital. He denied intensive physical pain but reported having sporadic attacks of nausea, shaking, loss of appetite and insomnia. 20 days post trauma patient complained symptoms and he was evaluated by psychologist.

The medications which was prescribed by psychologist were not providing much relief. He had experiencing insomnia and nightmares and noted that his presentation was tearful and marked by extreme anxiety and vigilance. Based on these complaints and medical history psychologist diagnosed PTSD.CAPS-5 Scale was equal to 42. Patient had received 2 interventions- Stellate ganglion block (SGB) at 0 and 2 weeks.

To determine whether paired SGB treatments at 0 and 2 weeks would result in improvement in mean CAPS-Scale for DSM-5 (CAPS-5) total symptom severity scores from baseline to 8 weeks should drop of 10 or more points.

Discussion: After the SGB, the patient experienced a major reduction in anxiety. Over the next week his improved allowing a significant reduction of antianxiety medications. Clinician Administered PTSD Scale (CAPS-5) level reduced.

References:

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Learning Points: Multiple CNS structures that are neuronally connected to the SNS appear to play a role in the onset and maintenance of PTSD. We report that selective blockade of the stellate ganglion relieved our patient's symptoms of PTSD.Further trials should be there.

25AP05-10

Swimming partially relieves chronic pain after thoracotomy via µ-opioid receptors in rats

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Background and Goal of Study: The purpose of this experiment was to utilize swimming exercise for the treatment of chronic pain after thoracotomy and to investigate the mechanism of action, including cytokines in the intercostal nerve and the effect of naloxone.

Materials and Methods: The experiment was divided into, shamoperated group, sham-swimming group, thoracotomy group, and thoracotomy-swimming group. Sprague-Dawley rats were trained to swim in water at a temperature of 37°C, seven days per week for four weeks. Behavioral responses to pain were measured using von Frey and acetone tests on day 1 after exercise, day 28 after exercise, and the day after 28 days of exercise, compared to naloxone injections. Cytokine levels were analyzed in the intercostal nerves of the four groups.

Results and Discussion: Increased force threshold and decreased cold sensitivity (scratches/min) in thoracotomy-swimming rats from day 14 to day 28 after swimming training. Naloxone injection (1 mg/kg) partially suppressed force threshold and increased cold sensitivity in thoracotomy rats. Swimming exercise suppressed tumor necrosis factor-alpha and interleukin-6 overexpression in intercostal nerves after thoracotomy.

Conclusion(s): The results showed that swimming exercise improves mechanical and cold allodynia after thoracotomy, while naloxone injection partially inhibits the analgesic effect of swimming exercise. Swimming exercise can reduce chronic pain after thoracotomy, which may be related to the inhibition of pro-inflammatory cytokine overexpression in intercostal nerves and activation of mu opioid receptor.

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25AP05-11

High-dose intravenous zinc sulfate effectively reduced electric shock and needle prickling pain in patients with postherpetic neuralgia: a retrospective study

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Background and Goal of Study: Postherpetic neuralgia (PHN) is characterized by various pain. Zinc deficiency leads to neuropathy due to loss of inhibition on NMDA receptors. Zinc deficiency is a risk factor for the development of PHN. We reported the successful treatment of PHN with high-dose intravenous zinc sulfate in two cases. Thus, intravenous zinc was often used to manage PHN in our pain clinic.

This retrospective study was aimed to investigate the associations between serum zinc status and pain characteristics was well as the analgesic efficacy of intravenous zinc in PHN.

Materials and Methods: PHN patients in our pain clinics underwent regular serum zinc assessments (normal range: 70-120 mcg/mL) starting in 2016. Patients routinely completed pain evaluation and answered the DN4 questionnaire. Patients were divided into two groups (serum zinc deficiency and sufficiency) using a cut-off of 70 mcg/mL. Demographic characteristics, zoster immunity, and the rate of each item in the DN4 were compared between the two groups.

Intravenous zinc (elemental zinc 5 mg/mL, 10 mL) was administered three times within two weeks following the first clinic visit. Pain scores and pain characteristics were assessed at the second clinic visit. Adult PHN Patients with serum zinc data and pain clinic visit ≥2 during the study period were selected form Hospital records.

Results and Discussion: 87 patients were selected. The distribution of serum zinc status was as follows: 35 patients had deficiency (<70 mcg/mL), 52 had sufficiency (70-120 mcg/mL), and none had excess (>120 mcg/mL). Proportions of the ten items in the DN4 questionnaire indicated that zinc-deficient patients experienced greater incidences of electric shock and needle prickling pain compared to zinc-sufficient patients (p = 0.037; 0.001).

A total of 150 mg of intravenous zinc effectively relieved electric shock and needle prickling pain in 65 PHN patients (74.7%) with a decrease in pain score of ≥2. Among the 22 non-responders, 16 patients had positive VZV IgM levels, indicating current or recent infection. Zinc supplementation effectively reduced neuropathic pain. However, patients with positive VZV IgM did not respond to zinc therapy.

Conclusion(s): Compared to PHN patients with serum zinc sufficiency, zinc-deficient patients had greater incidences of electric shock and needle prickling pain. Intravenous zinc effectively relieved pain in PHN. A well-designed prospective study using intravenous zinc is required to confirm these findings.

25AP05-12

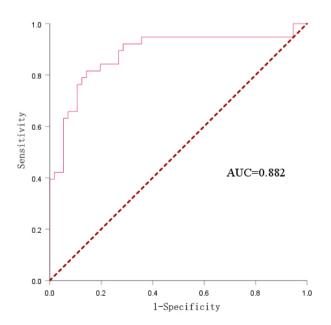
The association between preoperative pain threshold and the incidence of chronic postoperative pain in patients undergoing thoracoscopic pneumonectomy

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Background and Goal of Study: The early identification of patients at elevated risk for developing chronic postsurgical pain (CPSP) is crucial for mitigating the persistence of postoperative pain. This study aimed to investigate the potential of Pain Threshold (PT) as a predictive measure for identifying individuals at high risk of developing CPSP undergoing thoracoscopic pneumonectomy.

Materials and Methods: One hundred patients of both sexes, aged 18-75 yr, with body mass index of 18-35 kg/m², of American Society of Anesthesiologists Physical Status classification I or II, scheduled for thoracoscopic pneumonectomy at West China Hospital of Sichuan University from December 2019 to February 2020, were selected. The pain threshold was measured using Pain Vision at 1 day before surgery. Telephone follow-up was implemented by a pain questionnaire to assess CPSP (numerical rating scale score ≥1) at 3 months after surgery.

Multivariate logistic regression was used to identify the risk factors for CPSP, and the receiver operating characteristic curve was used to evaluate the accuracy of preoperative pain threshold in predicting CPSP.



Results and Discussion: Ninety-four patients were finally enrolled, of which 38 cases (40%) developed CPSP. The results of multivariate logistic regression analysis showed that low preoperative pain threshold was an independent risk factor for CPSP (OR=0.899, 95% confidence interval 0.854-0.946, P<0.001). The area under the receiver operating characteristic curve was 0.882 (95% confidence interval 0.804-0.960), Youden Index was 0.673, the sensitivity was 0.816, and the specificity was 0.857.

Conclusion(s): Low preoperative pain threshold is an independent risk factor for CPSP, and preoperative pain threshold can predict the occurrence of CPSP in the patients undergoing thoracoscopic pneumonectomy.

25AP06-2

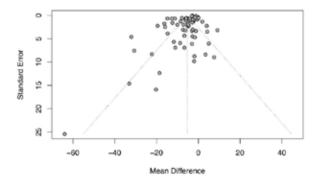
False positives with standard error-based funnel plots for assessing small-study effects: a systematic review and case study in non-opioid analgesics

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Background and Goal of Study: Funnel plots are used in the assessment for small-study effects in meta-analyses. Concerns have emerged over the use of standard error-based assessments due to the risks of type I errors, especially in pain meta-analyses¹.

Materials and Methods: We performed a systematic review of studies assessing sample size versus standard error-based funnel plots and publication bias tests. Results are reported narratively. We applied the method to the outcome of morphine consumption for alpha-2 agonists to demonstrate the issue using a funnel plot and Egger's regression test. All analyses were conducted in R.

Results and Discussion: We included 16 studies. Overall, there were concerns over excessive type I errors with outcomes expressed as standardised mean differences, odds ratios and proportions. For morphine consumption data, there were also excessive type I errors for mean difference outcomes where efficacy is predicted by baseline risk (control group morphine consumption). When evaluating morphine consumption for alpha-2 agonists, funnel plot asymmetry was observed with a P=0.004 when using standard errors. Therefore, we are uncertain whether this result represents evidence of publication bias or a type I error.



Conclusion(s): Standard error-based funnel plots may lead to type I errors with a number of different effect estimates relevant to acute pain trials. We suggest alternative Y axis specifications such as sample size-based plots and tests.

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25AP06-4

Pain neuroscience education on disease severity and cognitive function in patients with fibromyalgia: preliminary findings of a randomized controlled trial

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Background and Goal of Study: The study firstly aimed to determine the effectiveness of a nurse-led Pain Neuroscience Education (PNE) program designed by a multidisciplinary team, compared with an active control group on disease severity and cognitive performance in patients with fibromyalgia.

Secondly, we explored PNE-induced changes to the brain waves in patients with fibromyalgia.

Materials and Methods: This randomized controlled trial enrolled participants who met the 2016 American College of Rheumatology diagnostic criteria for fibromyalgia. Eligible participants were randomly assigned to a 6-week PNE group and a self-management education group of equal duration.

Fibromyalgia severity was assessed using the Fibromyalgia Impact Questionnaire-Revised (FIQR). Sustained attention was determined by Psychomotor Vigilance Test (PVT). Brain waves were assessed using quantitative electroencephalography (QEEG).

Resting-state EEG measurements with eyes closed were taken for 10 min using the BrainMaster Discovery 24 EEG device (Brainmaster Technologies, Inc., Bedford, OH, USA) and five minutes of artifact-free EEG were used in this study.

All measurements were taken at baseline and after the 6-week PNE program. Preliminary analyses of between-group differences were estimated by calculating Cohen's d for effect size.

Results and Discussion: Preliminary data from 7 participants were analyzed. Differences in PVT mean reaction time and lapses between participants with high disease severity (n =3) and those with moderate severity (n = 4) showed large effect sizes (Cohen's d = 0.99 and 1.09, respectively). A large pretest-to-posttest effect (Cohen's d = 1.85) in reductions of FIQR was observed for the PNE group.

Large effect sizes were demonstrated for increases in alpha and gamma brain waves after 6 weeks of PNE (Cohen's d = 0.84 and 0.85, respectively).

Conclusion(s): Fibromyalgia severity was associated with impaired sustained attention. PNE shows promising effects for improving disease severity and cognitions.

Acknowledgements: This study was supported partly by the grant (grant No.: NSTC 112-2314-B-038-143-MY3) from the National Science and Technology Council, Taiwan.

25AP06-5

Chemical ablation of genicular nerves with 95% ethanol for pain relief and quality of life in patients with knee osteoarthritis: a prospective, double-blinded, randomized, controlled trial

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Background and Goal of Study: Knee osteoarthritis (gonarthrosis) can cause significant pain, particularly in elderly patients who may not achieve adequate relief with NSAIDs, paracetamol, or coanalgesics.

This study aimed to evaluate the efficacy of ultrasound-guided chemical ablation of genicular nerves using 95% ethanol in reducing pain and opioid consumption and improving quality of life in this population.

Materials and Methods: This single-center, randomized, controlled, double-blind, non-inferiority study was conducted at the Pain Treatment Clinic, Transfiguration of Jesus Clinical Hospital, Poznan University of Medical Sciences. One hundred patients aged 65-92 years with advanced gonarthrosis (K-L grade 3 or 4) and pain scores (NRS >3) unresponsive to standard treatments were randomized into two equal groups: the neurolysis group (n=50), receiving ultrasound-guided ablation of genicular nerves with 4 x 0.5 ml of 95% ethanol, and the sham group (n=50). Pain scores were assessed as the primary outcome at 7 and 30 days, 3 and 6 months post-procedure. Secondary outcomes included quality of life scores (EQ-5D-5L), opioid consumption, and incidence of neurological complications.

Results and Discussion: The neurolysis group showed significantly reduced NRS pain scores and total opioid consumption compared to the sham group at all time points (p<0.0001). Quality of life scores on the EQ-5D-5L were also higher in the neurolysis group across all measured intervals. Notably, no neurological deficits were observed in either group at any time point, underscoring the safety of this procedure in elderly patients with gonarthrosis.

	Control group (n=50)	Neurolysis (n=50)	p-value
NRS – 7 days after procedure	6.70 (0.89)	3.00 (0.78)	<0.0001
NRS – 30 days after procedure	6.58 (0.78)	2.74 (0.69)	<0.0001
NRS – 3 months after procedure	6.44 (1.03)	2.90 (0.76)	<0.0001
NRS – 6 months after procedure	6.84 (1.00)	3.1 (0.74)	< 0.0001

		Control group (n=50)	Neurolysis (n=50)	p-value
	7 days after procedure	31.90 (18.58)	3.15 (5.27)	<0.0001
Total Opioid	30 days after procedure	31.60 (18.73)	2.70 (5.20)	<0.0001
Consumption	3 months after procedure	32.05 (18.40)	3.00 (5.46	< 0.0001
(miligrams of oral morphine per day)	6 months after procedure	33.70 (20.15)	3.30 (5.70)	<0.0001

Conclusion(s): Ultrasound-guided chemical ablation of genicular nerves with 95% ethanol offers a safe, effective approach to managing severe pain in knee osteoarthritis, reducing pain and opioid use, and enhancing quality of life without causing neurological deficits.

25AP06-6

Dorsal root ganglion stimulation for the treatment of chronic pelvic pain - serie cases

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Background: Chronic Pelvic Pain (CPP) is a heterogeneous neuropathic condition that has historically been difficult to treat. The DRG stimulator (DRGS) allows for more precise localization than the conventional spinal cord stimulators.

This case series aims to report clinical information from patients treated with DRGS, aiming to expand evidence favorable to the use of this device in the treatment of CPP of different etiologies, refractory to conventional treatments.

Case Report: This case series describes five patients with severe CPP who did not respond to a variety of pharmacological and interventional treatments. All five patients underwent successful implantation of the DRGS.

MEMS, 66 years old, with pain in the perineum and pubis radiating to the soles of the feet, after radiotherapy for uterine cancer. JNS, 27 years old, reported colicky hypogastric pain associated with interstitial cystitis and endometriosis.

JBS, 48 years old, with a history of Peyronie's disease and excruciating penile pain.

AMSF, 37 years old, with endometriosis and pain in the infraumbilical abdominal wall and vagina.

PARZ, 44 years old, with pain in the urethra and pelvic abdomen after natural delivery with forceps.

Following treatment, all these patients experienced significant pain relief, as well as reduced opioid consumption and experienced significant improvements in quality of life and continue to report sustained pain relief with high satisfaction and functional improvement.

Discussion: The CPP developed by these patients had different etiologies, with involvement of different nerve roots according to clinical evaluation. It was decided to implant the DRGS in an individualized and targeted manner based on the clinical information of each patient. This result is opposite to the case series reported by Hunter¹ who suggested a single electrode configuration in L1-S2 despite treating CPP of different locations.

Reference:

Hunter, CW; Yang, A. Dorsal Root Galglion Stimulation for Chronic Pelvic Pain: A Case Series and Technical Report on a Novel Lead Configuration. Neuromodulation: Technology at the Neural Interface, 2018; 22: 87-95.

Learning Points: Our case series demonstrates that the DRGS can be a reproducible and effective therapeutic option for controlling CPP refractory.

However, larger comparative studies are needed to establish future standards for DRGS in managing CPP. We advocate for individualized implantation, considering the patient's symptoms.

25AP06-7 Complex pain scale for combat injuries (CPSCI)

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Background and Goal of Study: Now, the problem of assessing the intensity of pain syndrome and analgesia in combat wounds is very important and occupies a central place both in our country and around the world. There are many different pain scales. But the existing scales for determining the level of pain syndrome in the wounded need to be developed and improved. Therefore, the aim of our study was to create a new scale for the assessment of pain in wounds.

Materials and Methods: During the full-scale Russian-Ukrainian war a study was conducted, which included 80 wounded people aged 18 to 60 with combat mine-explosive injuries received during the last day. Patients are divided into 2 groups of 40 people each - group 1 and group 2.

In group 1, a numerical pain assessment scale was used to assess the pain syndrome of conscious patients, and for patients with impaired consciousness or under sedation, a pain assessment scale during emergency medical care was used.

In group 2, we additionally used Complex pain scale for combat injuries. For the wounded in a state of hemorrhagic or traumatic shock, a correction factor of + 4 points is introduced.

Points	0	1	2
Indicators			
Heart rate, beats/min	55 – 85	85 – 110	110 and more
Mean arterial pressure, mm Hg	70 - 110	110 - 120	120 – 130 and more
Level of glucose in blood plasma, mmol/l	3,5 – 5,5	5,5 - 10	10 and more
Moisture of the skin	Dry skin	Moist skin	Very moist skin
The nature and extent of damage to tissues and organs	Minor gunshot shrapnel blind wounds	Significant damage to 1 organ or limb	Significant damage to several limbs or limbs and organs
Anamnesis of analgesia	Regional analgesia and/ or neuraxial analgesia and/or NSAIDs and/or acetaminophen and/or opiates and/or ketamine	NSAIDs and/or acetaminophen	Without analgesia

Table.

Interpretation: 0 - without pain; 1 - 4 points - mild pain, 5 - 8 points moderate pain, 9 - 12 severe pain, 13 - 16 unbearable pain.

Results and Discussion: We found that the patients of group 2 had more stable hemodynamics and glucose levels during the anesthesia stage and during wound dressing or at the traumatic moment of the operation. The level of pain syndrome according to the numerical pain assessment scale on the 2nd and 3rd day of stay in ICU was lower in group 2. The time of stay in ICU was also shorter in patients of group 2.

Conclusion(s): In this way, the provided scale allows to evaluate and objectify the manifestations of pain syndrome in injuries and provides an opportunity for a more qualitative and personalized approach to analgesia for each patient. However, the question of adequate assessment of pain in injuries remains open and requires further research and study.

25AP06-8

Astrocytes specifically enhance the SST interneurons-dependent synaptic transmission in VTA to induce depression in a mouse model of chronic neuropathic pain

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Background and Goal of Study: Approximately 50%-85% of the chronic pain patients experience depression. Ventral tegmental area (VTA) GABAergic neurons play a crucial role in regulating emotions, and mainly classified into somatostatin (SST) and parvalbumin (PV) expressing neurons.1

Inward rectifying potassium channel 4.1 (Kir4.1) is an important potassium channel mainly expressed in astrocytes. Kir4.1 in lateral habenula (LHb) is upregulated in lipopolysaccharide (LPS)induced depression; and Lys05 (an inhibitor of Kir4.1) reversed the depression-like phenotype.2-3

However, it is unclear that how Kir4.1 change in chronic pain-induced depression.

Materials and Methods: Chronic constriction injury (CCI) model was used to induce chronic pain in mice, and depressive behaviors and effects of Lys05 were tested. The adeno-associated virus (AAV) was designed to knockdown or overexpress Kir4.1 in VTA astrocytes. Patch-clamp recording was applied to explore the effects of Kir4.1 on the excitability of VTA neurons. Specific activation of VTA GABASST or VTA GABAPV neurons by optogenetics was used to explore the role of neuronal subtypes.

Results and Discussion: Expression of Kir4.1 was decreased in VTA in the CCI-induced depression mice. Lys05 reversed the depressive behaviors induced by LPS; but produced no treatment to the depressive behaviors by chronic pain. The mice became depression after knockdown of Kir4.1 in VTA astrocytes.

Correspondingly, overexpress of Kir4.1 in VTA astrocytes reversed the depressive behaviors by chronic pain. Knocking down Kir4.1 in VTA astrocytes decreased excitability of dopaminergic neurons. Specifically inhibiting VTA GABASST neurons, but not GABAPV neurons, significantly rescued the depressive behaviors in the VTA Kir4.1 knockdown and/or chronic pain mice.

Conclusions: The expressions of Kir4.1 in VTA astrocytes are decreased by chronic pain, which activates GABASST neurons and inhibits dopaminergic neurons, then leads depressive behaviors. References:

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25AP06-9

To compare the opioid sparing effects of combination of dexamethasone, paracetamol and ketorolac vs paracetamol, ketorolac in patients undergoing total laparoscopic hysterectomy: a prospective double blind randomized controlled trial

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Background and Goal of Study: Postoperative pain management is essential especially after total laparoscopic hysterectomy (TLH). In recent years, there has been a concerted effort to explore opioid-sparing strategies that minimizing associated side effects.

This study hypothesizes that adding preemptive dexamethasone to paracetamol and ketorolac will reduce opioid consumption compared to paracetamol and ketorolac alone in women undergoing elective TLH.

Materials and Methods: This double-blind, randomized controlled trial at AIIMS, New Delhi, included 100 ASA I/II patients undergoing elective laparoscopic hysterectomy. Patients were randomized using STATA software with concealed allocation via opaque envelopes into two groups

Group C (Control): 10 mL saline pre-surgery, followed by IV ketorolac (30 mg) and paracetamol (1 g).

Group D (Study): Dexamethasone (0.2 mg/kg) pre-surgery, followed by IV ketorolac (30 mg) and paracetamol (1 g).

Postoperative Pain Management: Patient controlled analgesia pump with 20µg fentanyl boluses and a 15-minute lockout interval. Primary outcome: Total fentanyl use in 24 hours.

Secondary outcomes: VAS pain scores, postoperative nausea and vomiting (PONV), blood glucose, and wound healing.

Statistical Analysis: Data were analyzed using STATA 15.0. Descriptive statistics and Student's t-test or Wilcoxon signed-rank test were used, with p < 0.05 considered significant.

Results and Discussion: A total of 100 patients undergoing elective laparoscopic hysterectomy were analyzed. Demographic parameters, including age, BMI, and ASA grade, were comparable between groups. Fentanyl consumption in the first 24 hours was significantly higher in Group C (231.72 ± 84.07 μg) than Group D $(138 \pm 48.7 \,\mu\text{g})$ (p < 0.0001). Pain scores on the 0-100 VAS scale showed significant differences at all time points between groups (p < 0.05). PONV scores differed at 15 and 30 minutes (p < 0.05). A transient rise in blood glucose occurred in Group D at 16 hours (122 g/dl vs 115 g/dl in Group C, p = 0.013). Wound healing was similar in both groups.

Conclusion(s): In patients undergoing total laparoscopic hysterectomy, a multimodal analgesia regimen with dexamethasone, paracetamol, and ketorolac reduced 24-hour opioid use, improved pain scores, and minimized immediate postoperative nausea and vomiting. No safety concerns, including hyperglycemia or delayed wound healing, were found with perioperative dexamethasone use.

25AP06-10 Walking towards post-surgical comfort

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Background and Goal of Study: Since the creation of our acute pain unit at our Hospital in 2013, we have been improving patient satisfaction in terms of postoperative acute pain control, working for the goal of optimizing postoperative patient comfort. For our health system, a pain assessment every 24 hrs for postoperative patients is a quality standard. However, we believe that a VAS assessment per nursing shift is necessary, since a single assessment in 24 hrs is insufficient for optimal pain control.

For this reason, we decided to take a series of measures in 2024, with the aim of raising awareness among healthcare personnel, both surgeons and nurses, of the importance of optimal pain control, due to the significant morbidity of poor pain control in the postoperative period.

Thus, the goal of this study is to check if these implementations improve postoperative patient comfort.

Materials and Methods: The measures we implemented were:1-Continuing education programs for nurses and doctors. 2- Clinical guide and management of acute postoperative pain for nursing. 3- "Bottom up" monitor in post-surgical hospitalization wards. This is a pain monitoring system, which identifies the VAS records with different colors as a pain traffic light, visualizing the intensity of the pain that patients present. White color indicates first pending pain record, green represents VAS 0-2, yellow indicates a VAS 3-5, and red VAS 6-10.

In addition, it has flashing visual alarms that indicate when it is necessary to record the VAS again, 4- Increased number of VAS assessment instead of once every 24 hrs using "bottom up" monitorization.

Results and Discussion: In 2023, 11,379 patients were registered, 92.04% had at least one VAS assessment every 24 hrs recorded, and 8.76% had a record per shift. In contrast, results in 2024 were 97.24% for only one register every 24 hrs and 53.10% per shift. With the new implementations in 2024, 7,259 patients were recorded (from January 1st to September 30th).

Among them 6,628 (91.3%) were monitored with "bottom up" and 631 (8.7) were not monitored. With these new implementations, patient satisfaction increased up to 98.9% in relation to pain con-

Conclusion(s): We consider that the measures implemented are generating a positive impact on the management of acute postoperative pain in our hospital, since the recording of 1 VAS assessment every nursing shift has increased patient satisfaction up to 98.9% in relation to pain control.

25AP06-11

Enhancing traumatic neuropathic pain control following spinal cord injury with regional anesthesia

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Background: Neuropathic pain (NP) is highly prevalent in patients following traumatic spinal cord injuries (TSCI). Management typically relies on pharmacological strategies; however achieving effective control remains challenging¹.

The use of regional anesthesia (RA) in patients with preexisting neurological conditions poses unique challenges due to concerns about exacerbating deficits or causing new complications. These risks necessitate careful evaluation and individualized planning.

Case Report: A 25-year-old man, ASA I, was admitted to the Intensive Care Unit (ICU) following a vehicle accident. He presented with multiple trauma, including vertebro-medullary trauma with a C7 'teardrop' fracture and dislocation of C6 with spinal cord (SC) involvement. Urgent surgical correction and stabilization were performed. During hospitalization, he developed severe NP along the C6-C7 pathway on the left side.

Cervical MRI revealed SC contusion at C6-C7, associated with SC edema and apparent narrowing of the left neural foramen.

Despite the early implementation of multimodal analgesia, including Paracetamol, Gabapentin, Tapentadol, Duloxetine, Baclofen, Ketorolac and Dexamethasone, the patient continued to report severe pain, rating it 9/10 on the Numeric Rating Scale (NRS). Given the insufficient pain control, the placement of a perineural catheter was proposed.

An infraclavicular brachial plexus block was selected and performed under ultrasound and neurostimulator guidance, considering the patient's ongoing need for a cervical collar.

Pain control improved with ropiyacaine 0.2%, 7 mL every 4 hours. reducing the NRS score to 4/10.0n the twentieth day, he was transferred from the ICU to his local hospital for ongoing care.

Discussion: NP is a challenging complication following TSCI.Neurological compromise may increase the risk of additional injury with RA, potentially due to the 'double-crush phenomenon' or the heightened vulnerability of partially demyelinated nerves to local anesthetics2.

Voltage-gated sodium channel alterations in NP make local anesthetics and RA a promising tool for pain control3.

References:

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- 3. Campbell, James N.,et.al, Mechanisms of neuropathic pain Learning points: RA offers a promising, safe, and effective adjunct for managing NP in TSCI patients, enhancing pain control.

25AP06-12

Preoperative administration of duloxetine does not affect long-term functional recovery after surgery, but it may help reduce immediate postoperative pain

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Background and goal of study: Duloxetine has been shown to reduce postoperative pain and the need for opioids when administered preoperatively in spinal and laparoscopic surgeries. However, its use in multimodal analgesia for high tibial osteotomy has not been studied, and its effectiveness remains unclear.

In this study, we examined the effects of preoperatively administered duloxetine on postoperative long-term functional recovery, as well as its impact on postoperative pain.

Materials and methods: This prospective randomized controlled trial compared the efficacy of duloxetine in knee surgery. From November 2020 to May 2022, 129 patients undergoing elective high tibial osteotomy under general anesthesia with femoral nerve block were enrolled (UMIN000043795).

Patients were randomly assigned to receive duloxetine (intervention) or not (control). Duloxetine administration started one month before surgery, with an initial dose of 20 mg, increased to 60 mg by two weeks pre-surgery, and maintained for two weeks post-operatively.

The primary outcome was the KOOS (Knee Injury and Osteoarthritis Outcome Score) six months after surgery.

Secondary outcomes included NRS (Numeric Rating Scale) scores for pain on days 1, 3, 5, and 7 after surgery and the number of analgesics used within 24 and 48 hours post-surgery.

Statistical analysis used chi-squared tests for categorical variables and t-tests for continuous variables (R, version 3.4.1), with p < 0.05 considered significant.

Results and discussion: Of the 129 enrolled patients, 105 met the inclusion criteria. 47 patients were in the duloxetine group. Twenty-four patients were excluded, 14 of whom could not take duloxetine as per the protocol.

The KOOS total score six months post-surgery was 70.12 in the intervention group and 72.85 in the control group, with no significant difference (p = 0.274).

The NRS score on the first day after surgery was 3.40 in the control group and 2.45 in the intervention group (p = 0.50).

However, the number of times analgesics were used within 24 hours was significantly different: 1.76 times in the control group and 1.02 times in the intervention group (p = 0.018).

Conclusion(s): While preoperative duloxetine does not impact long-term postoperative functional recovery, it may be effective for perioperative pain relief. However, many cases had difficulty continuing with the medication, and tolerability of the drug remains an issue.

25AP06-13

Navigating complex anesthesia: a case of multi-drug allergies and safe pain managment

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Background: Managing elderly patients with complex surgical and anesthesia histories presents unique challenge, particularly when the patient has a history of anesthetic complications such as repeated cardiac arrests

Case Report: A 74 old lady with a history of three episodes of cardiac arrest under anesthesia, She had undergone nine spine surgeries between 1990 and 1993 following a traumatic spinal injury, along with other procedures such as a hysterectomy and appendectomy.

The first cardiac arrest occurred during a hysterectomy, and the second and third during spinal surgeries. All surgeries were performed under general anesthesia, and except for the cardiac arrest episodes, they were otherwise uneventful.

The patient reported known allergies to short-acting local anesthetics, morphine, paracetamol, and penicillin. No other significant comorbiditieswere noted. Given her history of cardiac arrest, the anesthesia team selected medications with the least potential for allergic reactions and better hemodynamic stability.

General anesthesia with inhalational Sevoflurane and oxygen was planned, using a Laryngeal Mask Airway (LMA) withspontaneous ventilation to avoid neuromuscular blockers, as they are the most common agents in anesthesia to cause allergic reactions.Intraoperative pain management included ketamine and dexmedetomidine infusions.

The procedure was stable, and extubation was smooth. However, the post-procedural Dex-Ket infusion did not provide adequate pain control. A sciatic popliteal nerve block was then performed with an intradermal test dose of local anesthetic (0.125% Bupivacaine) to rule out hypersensitivity reactions.

The procedure was uneventful, with stable vital signs and no adverse reactions. Tramadol was added to the postoperative plan as needed for pain control.

Discussion: Anesthetizing a patient with a history of hypersensitivity reactions to multiple drugs including anesthetic agents present significant challenge, epidemiology data suggest that young females are more susceptible to hypersensitivity reactions, including anaphylaxis, in our case a history of cardiac arrest due to suspected anaphylaxis during previous surgeries was raisedIn Australia, the incidence of anaphylaxis is estimated to be between 1 in 10,000 and 1 in 20,000(Sally Ann Ryder, 2004) [2]. The clinical presentation of anaphylaxis and anaphylactoid reactions is similar, but the underlying mechanisms differ.

Metabolic Disease and Obesity

26AP01-1

Hyperacetylation increases myocardial ischemia-reperfusion injury sensitization by mediating Mitochondrial supercomplex assembly in T2DM

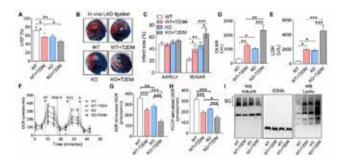
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Background and Goal of Study: Epidemiological investigations have shown that type 2 diabetes mellitus (T2DM) remarkably enhances the sensitization of myocardial ischemia reperfusion (I/R) injury. Mitochondrial hyperacetylation is closely related to Sirt3, a mitochondrial NAD*-dependent deacetylase. In T2DM patients, Sirt3 is downregulated.

This study aimed to explore the mechanism by which Sirt3 increases myocardial susceptibility to I/R injury under T2DM.

Materials and Methods: Mice were subjected to a high fat diet (HFD) for 8 weeks, with intraperitoneal STZ injection in the fourth week to induce T2DM. Left anterior descending coronary artery ligation was performed to induce I/R injury in vivo. Cardiac function was evaluated using echocardiography, while levels of LDH and CK-MB were measured via a chemistry analyzer. Mitochondrial function was assessed using a seahorse XF24 analyzer. Mitochondrial supercomplex (SC) assembly and acetylation levels were examined through blue native gel electrophoresis of mitochondrial proteins.

Results and Discussion: Cardiac ultrasound showed a decreased left ventricular ejection fraction in T2DM mice compared with control mice after I/R injury (Fig.1 A). Consistent with the decreased cardiac function, the infract size of T2DM heart and plasma levels of the LDH and CK-MB were increased (Fig.1 B-E). Mechanistically, we found that ADP-stimulated and FCCP-stimulated respiration was decreased in mitochondria of T2DM mice hearts (Fig.1 F-H). Additionally, a decreased expression of Ndusf4 and an increased acetylation level was observed on mitochondrial SC (Fig.1 I). Moreover, Sirt3 knock out (KO) induced mitochondrial hyperacetylation, which aggravated cardiac function, increased infract size and the levels of LDH and CK-MB under T2DM mice after I/R injury (Fig.1 A-E). With a higher mitochondrial acetylation, KO reduced mitochondrial function and mitochondrial SC assembly in the T2DM hearts (Fig.1 F-I).



Conclusion(s): Our data suggest that myocardial I/R injury sensitization in T2DM may be due to Sirt3 deficiency induced mitochondrial SC hyperacetylation, which may downregulate mitochondrial SC assembly and respiratory efficiency.

26AP01-2

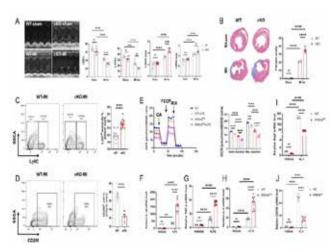
Defective branched-chain amino acids metabolism exacerbates myocardial infarction injury by affecting the phenotype and function of macrophages

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Background and Goal of Study: Macrophages play a central role in tissue injury and repair post myocardial infarction (MI), undergoing a transition from proinflammatory to reparative phenotyp e to aid tissue healing. Branched-chain amino acids (BCAAs), including leucine, isoleucine and valine, whose aberrant accumulation was related to pathological ventricular remodeling post MI. Here, we investigate the role of BCAAs in macrophages phenotypic transition and MI process.

Materials and Methods: Wild-type (WT) and macrophage-specific PPM1K knockout (cKO) mice, with defective BCAAs catabolism, were received left anterior descending coronary artery ligation for four weeks to establish MI model. Echocardiography was used to assess cardiac function. We used Masson staining to evaluate myocardial fibrosis. Flow cytometry, Seahorse analyzer and qPCR were conducted to evaluate the phenotype and functions of macrophages in Raw264.7.

Results and Discussion: Macrophage-specific PPM1K deletion worsened cardiac contractile function and promoted tissue fibrosis, as evidenced by lower LVEF%, larger left interior diameter (Figure 1A) and increased infarct size (Figure 1B). Furthermore, the proportions of mononuclear macrophages were increased post MI in both peripheral blood and heart of cKO mice, especially Ly6Chi macrophages while CD206+ macrophages decreased in heart (Figure 1C and 1D), suggesting that cKO mice were still dominated by inflammatory macrophages post MI. Consistently, PPM1K deletion in Raw264.7 decreased the mitochondrial respiration of macrophages (Figure 1E) and promoted inflammatory cytokines (e.g IL-1\beta, IL-6 and TNF-a) gene expression (Figure 1F-H), but downregulated the markers of reparative-macrophages gene expression, such as CD206 and Arg1 (Figure 1I and 1J) in vitro. Taken together, the results showed that PPM1K deficiency promoted inflammatory response and impaired reparative functions of macrophages.



Conclusion(s): Our findings showed that defective BCAAs metabolism of macrophages promoted inflammatory response of macrophages and inhibited macrophages transit to reparative phenotype, might leading to excessive inflammation and adverse remodeling post MI.

26AP01-3

Ultrasound-guided external oblique intercostal plane nerve block for bariatric surgeries: a superior block for the morbidly obese? A case study

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Background: Optimisation of postoperative pain for bariatric surgeries can be challenging due to comorbidities such as obstructive sleep apnoea (OSA). Obese patients also report increased pain severity and interference (1).

The use of opioids may lead to respiratory depression and increased risk of postoperative nausea and vomiting in an at-risk group. Enhanced recovery guidelines in bariatric surgery show a decrease in opioid requirements with regional techniques (2).

We aim to describe and discuss the advantages of external oblique intercostal(EOI) block as part of a multimodal analgesic approach for bariatric surgeries.

Case Report: This case details the anaesthetic management of a 45-year-old female (BMI 64.7) with diagnosed severe OSA and obesity hypoventilation syndrome who underwent laparoscopic sleeve gastrectomy with ultrasound-guided bilateral EOI blocks (total 50ml 0.2% ropivacaine) after induction. In total, she received 200mcg of intravenous fentanyl. Postoperatively, sheexpressed "no pain" and maintained saturations without her usual BiPAP. No further opioids were required. She was discharged well the next day.

Discussion: The EOI block is a novel fascial plane block that provides analgesia to the anterolateral upper abdominal wall via the lateral and anterior cutaneous branches of the T6/7 to T10/11 intercostal nerves. The EOI block is easily performed in a supine position after induction. There is currently no published study comparing EOI with other regional blocks providing analgesia in similar dermatomes, e.g. the erector spinae plane or quadratus lumborum (3). These require targeting of significantly deeper structures that are challenging in obese patients.

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Learning Points: This case highlights the success and efficacy of the novel EOI block in a high risk morbidly obese patient and describes its advantages. It is practical, allows for opioid-lite analgesiawith excellent pain scores and mitigates postoperative complications in obese patients. Further high-quality studies should be performed to strength current evidence.

26AP01-4

Long-term outcomes of Roux-en-Y gastric bypass on weight loss and obesity-related medical comorbidities: a retrospective, observational study in a Portuguese tertiary center

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Background and Goal of Study: Obesity is a complex multifactorial disease characterized by excessive accumulation of fat predisposing individuals to develop metabolic related comorbidities. However, the lack of strong evidence regarding long-term outcomes of weight loss following bariatric surgery in the Portuguese population justifies further investigation.

Our goal was to evaluate percentage of weight loss and reduction of body mass index (BMI) over 5-12 years in patients who underwent Roux-en-Y gastric bypass (RYGB) and to describe the impact of weight loss on obesity related comorbidities.

Materials and Methods: An observational retrospective and longitudinal cohort study was conducted evaluating weight loss and obesity related comorbidity remission on patients who underwent primary bariatric surgery (RYGB) between 2011 and 2018. A cohort of 303 patients was obtained. Institutional Ethical Board approved the study, waiving informed consent. Quantitative data were presented as mean and standard deviation, while categorical variables were expressed as absolute and relative frequen-

In our analysis, we employed IBM SPSS Statistics (Version 29) to perform both bivariate analyses using logistic and linear regression techniques. A p-value of <0.05 and a 95% confidence interval was considered statistically significant, without adjustments for multiplicity.

Results and Discussion: The patient population included in the study was predominantly female (84.5%), mean age of 45 years and mean BMI of 35.4 Kg/m2 at the time of surgery. The majority of patients were classified as ASA-PS III (52.5%). After surgery, the average weight lost at minimum weight was 41.4kg (36% of initial body weight). The analysis of long term weight loss revealed a % weight loss of 27,7% over the entire study period, with a similar percentage of BMI decrease (28.6%).

In this study, 18% of patients had significant weight regain at the ≥2 year follow-up mark according to the >10kg from nadir definition, with this value increasing to 38% by the ≥5 year follow-up stage.

Despite the weight regain observed, it should be noted that the patients' BMI in 2020 and 2023 are close to what is defined as normal (24.6 in 2020 and 25.3 in 2024), underscoring the effectiveness of bariatric surgery in achieving weight loss.

Significant remission rates of obesity-related comorbidities were recorded: 73.9% for obstructive sleep apnea (OSAS), 67.7% for type 2 diabetes, 62.5% for high blood pressure (HBP) and 55.8% for dyslipidemia.

Conclusion(s): The authors validate the Roux-en-Y gastric bypass (RYGB) in obese patients as an effective surgery in terms of weight reduction up to 12 years of follow-up. Long-term BMI values close to those of non-overweight individuals were observed.

Anaesthetic management of emergency bilateral femur surgical fixation in a patient with newly diagnosed large adrenal incidentaloma – a case report

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Background: Adrenal incidentalomas have become increasingly common in patients undergoing computed tomography (CT) scans. Anaesthesia may be required in some of these patients who present for emergency surgery, without adequate time for further evaluation and optimization.

Case Report: A 68 year-old woman with hypertensive urgency presented following an accident with lower limb open fractures. A 7.2x4.1x4.7cm right adrenal mass was incidentally noted on the trauma CT.

The patient had symptoms suggestive of phaeochromocytoma, but emergency surgeries were required, leaving insufficient time for definitive work-up and adequate alpha-blockade. Preemptive treatment for phaeochromocytoma was commenced peri-operatively.

External fixation was performed under general anaesthesia, with initiation of Phentolamine infusion peri-operatively on day 2 of admission. Alpha-blockade with Phenoxybenzamine was then started.

Definitive fixation was performed on day 6 of admission. Opioidsparing techniques to prevent phaeochromocytoma crisis were employed. The patient eventually underwent laparoscopic adrenalectomy, with histology proven adrenal cortical adenoma.

Discussion: This case presents a clinical dilemma: an emergency surgical condition requiring intervention versus the risk of a pheochromocytoma crisis without adequate alpha blockade. There is a paucity of data on how to manage such patients.

This highlights the anaesthetic considerations, such as avoidance of triggers, fluid and electrolyte management, and the management of peri-operative blood pressure changes.

References:

Lee JM, Kim MK, Ko SH, et al. Clinical Guidelines for the Management of Adrenal Incidentaloma. *Endocrinol Metab.* 2017;32(2):200-218.

Hariskov, Stefan; Schumann, Roman. Intraoperative management of patients with incidental catecholamine producing tumors: A literature review and analysis. Journal of Anaesthesiology Clinical Pharmacology 29(1):p 41-46, Jan–Mar 2013.

Learning Points: Clinical studies have shown that cortisol-secreting adenomas are more prevalent than phaeochromocytomas. With the increasing rates of adrenal incidentalomas, preemptive management for phaeochromocytoma before surgery should be considered in patients with adrenal incidentalomas and hypertensive urgency to avoid precipitating a crisis.

26AP01-7

Perioperative considerations for adult patients with pyruvate dehydrogenase complex deficiency

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Background: Pyruvate dehydrogenase complex deficiency (PDCD) is a rare mitochondrial disorder with significant anesthetic considerations.¹

Clinical manifestations include intellectual delay, neuromuscular diseases and severe metabolic acidosis. Due to associated high childhood mortality, it is often considered a pediatric disease, however, many patients survive into adulthood. This case report describes a successful case of anesthesia provided for an adult with PDCD.

Case Report: A 35-year-old man presented for wisdom teeth extraction. The patient is known for E1-alpha subunit related deficiency. His symptoms include developmental delay, hypotonia, spasticity, seizure disorder and scoliosis. A peripheral intravenous (IV) access was obtained pre-op with parental presence.

Anesthesia was provided using TIVA with rocuronium, avoiding potential triggers of malignant hyperthermia (MH) and lactic acidosis. Standard monitors were used with EEG-monitoring. Nasal intubation was successful with videolaryngoscopy without difficulty. Venous blood gas did not show signs of lactic acidosis.

The patient remained hemodynamically stable throughout the procedure and emergence, with successful reversal with sugammadex. The post-anesthesia recovery was uneventful.

Discussion: We present a unique case of providing anesthesia for an adult patient with PDCD. There is a paucity of information on perioperative management of PDCD, especially in adults with only one additional case report.²

Feared complications with PDCD are MH, propofol infusion syndrome (PIS) and lactic acidosis. Our case shows that the use of propofol for TIVA with rocuronium can be a safe option for adult PDCD patients undergoing a short procedure under general anesthesia.

References:

- 1. Ganetzky R, McCormick EM, Falk MJ. Primary Pyruvate Dehydrogenase Complex Deficiency Overview. 2021 Jun 17. In: Adam MP, Feldman J, Mirzaa GM, et al., editors. GeneReviews® [Internet]. Seattle (WA): University of Washington, Seattle; 1993-2024.
- 2. Piñero-Merino M, García-Aroca M, Alvarez Avello JM. Management of a patient with pyruvate dehydrogenase deficiency. *Minerva anestesiologica*. 2023;89:227-229.

Learning points:

- Consider parental presence for pre-operative IV placement
- · Propofol is likely safe for short procedures with low risk of PIS
- Rocuronium appears safe with no evidence of prolonged effect and successful reversal with sugammadex
- Suggest placement of large IV or arterial line to monitor lactate in high risk cases.

Targeting brown adipose tissue thermogenesis by astrocytic acetate mitigates diet-induced obesity in mice

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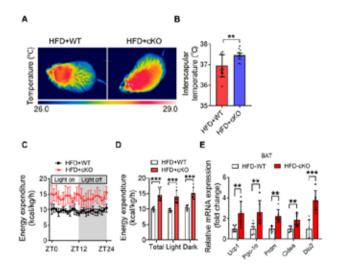
Objective: Obesity is a deteriorating global health concern. Accumulating studies highlight the significance of gut microbiota, such as acetate, in the emergence of various metabolic processes. As the specific energy substrate, whether acetate in astrocytes is required for the regulation of energy balance in obesity remains

The study is to explore the potential mechanism of astrocytic acetate in the metabolic regulation of obese mice.

Methods: Using a mouse model of high-fat diets (HFDs) for 12 weeks, we induced diet-induced obesity, which is common in humans. Body mass was measured. Plasma concentrations of total cholesterol (TC) and triglycerides (TG) were measured to profile the metabolic change. Interscapular brown adipose tissue (BAT) temperature was determined with an infrared thermal camera. Energy expenditure was measured using an indirect respiration calorimetry system. mRNA expression of thermogenic genes in BAT was calculated with RT-PCR.

Results and Discussion: Through astrocyte-specific Acss1 deletion to elevate acetate levels, we observed mitigated metabolic impairments in HFD mice. Compared with the HFD-WT mice, HFD-cKO mice showed significantly less body weight gain, which was associated with reduced total fat mass but unchanged lean mass (Fig. 1A-C).

Plasma TC and TG levels were significantly reduced in HFD-cKO mice, compared with HFD-WT mice (Fig. 1 D-E). Moreover, HFDcKO mice showed a significantly higher interscapular BAT temperature than HFD-WT mice (Fig. 2A-B). The energy expenditure and mRNA expression of thermogenic genes in BAT were significantly increased in HFD-cKO mice (Fig. 2C-E).



In the study, we found that high levels of acetate in astrocytes are required for the thermogenesis in BAT, thus protecting mice against dietary obesity.

Conclusion: Our findings provide evidence that astrocytic acetate is required to combat obesity.

26AP02-1

Aortic valve replacement in a patient with Alkaptonuria: a case report

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Background: Alkaptonuria (AKU) is a rare inherited metabolic disorder, less frequent than 1 in 250 000 births, caused by Homogentisate 1,2-dioxygenase enzyme deficiency, which converts homogentisic acid (HGA) in the catabolic pathway of tyrosine.

Thus, HGA accumulates in connective tissues, producing ochronosis (colored pigment) and arthritis. Commonly, patients suffer also from valvular heart disease, restrictive lung disease and renal complications.

Case Report: A 62-year-old known alkaptonuric patient, after a syncope, was diagnosed with severe aortic stenosis (peak/ mean PG 80/54 mmHg, AVA 0,7 cm²) and was referred for surgical aortic valve replacement. His LVEF was normal, he had COPD, hypertension, low back pain, and allergy to aspirin, been also smoker for 45 years.

Airway examination revealed Mallampati I, no restrictions in neck movements, thyromental distance 8 cm and mouth opening > 5cm. His lab tests were normal, and he was classified as NYHA II, ASA III patient, having EuroSCORE II <1 %. During surgery, a 21 mm Inspiris Resilia aortic valve was implanted, total duration of cardiopulmonary bypass (CPB) was 90 min, and aorta clamped time was 75 min.

Weaning from CPB was uncomplicated and patient was extubated in the ICU some hours later. Postoperative transthoracic echo showed normal functioning bioprosthetic valve and patient was discharged from hospital a week later.



Discussion: AKU is a rare disorder that can cause pigment deposition in heart valves and progressive valve dysfunction. Arthritis and ochronosis could make perioperative management of these patients challenging.

References:

- 1. Pandey et al. Perioperative management of patient with alkaptonuria and associated multiple comorbidities. J Anaesth Cl Pharma 27(2):p 259-261, Apr-Jun 2011.
- 2. Selvakumar et al. Ochronosis of the aortic valve. J Thorac Dis 2018;10(5):E332-E334.

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Learning points: Following guidelines for general population can apply for patients with AKU undergoing heart surgery.

26AP02-2

Combined multi-omics analysis identifies the mitochondrial metabolism mechanisms underlying sarcopenia

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Background and Goal of Study: Sarcopenia is a progressive geriatric syndrome of skeletal muscle dysfunction with complex etiology and currently lacks pharmacological treatment.

This study will explore the molecular characteristics and energy metabolism changes of sarcopenia from the perspectives of mitochondrial energy metabolism and multi-omics, identify key pathogenic genes, and provide new targets for the prevention and treatment of sarcopenia.

Materials and Methods: A cohort of 60 age- and sex-matched elderly individuals was selected from West China Hospital, Sichuan University, based on the Asian Working Group for Sarcopenia (AWGS) criteria. Participants were divided into three groups: Healthy Aged (HA), Possible Sarcopenia (PS), and Sarcopenia (S), with 20 individuals per group.

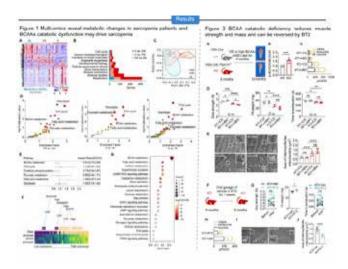
Transcriptome and metabolome analyses were conducted to compare differences among the three groups. Machine learning models and KEGG enrichment analysis were utilized to clearly distinguish key genes that differentiate sarcopenic from non-sarcopenic populations.

Concurrently, a mouse model with skeletal muscle-specific *Ppm1k* knockout (KO) was established to observe differences in skeletal muscle function and mitochondria, and mass spectrometry analysis was employed to detect the content of branched-chain amino acids (BCAAs) (Figure 1).



Figure 1. Overview of the experimental design workflow.

Results and Discussion: Multi-omics reveal metabolic changes in sarcopenia patients and BCAAs catabolic dysfunction may drive sarcopenia. BCAA catabolic deficiency impairs skeletal muscle function and can be reversed by BT2 in mouse.



Conclusion(s):

- 1. Sarcopenia patients' skeletal muscles exhibit energy metabolism disorders and mitochondrial dysfunction.
- 2. Multi-omics analysis reveals that impaired BCAA catabolism is involved in the development of sarcopenia.
- 3. Medications that promote BCAA metabolism can improve sarcopenia.

26AP02-3

A mitochondrial depletion syndrome case – which anesthetic plan might be safer?

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Background: Mitochondrial depletion syndrome (MDS) is a rare genetic disorder characterized by reduced mitochondrial DNA content, resulting in multisystem dysfunction. All general anesthetics pose risks by disrupting mitochondrial bioenergetics. Anesthetic management is challenging due to potential neuromuscular, respiratory, and cardiovascular complications¹. No anesthetic plan is proven safer than others. We describe the strategy used for a plastic surgery patient.

Case Report: An 18-year-old male with MDS presented for elective mentoplasty due to chin hypertrophy and asymmetry. Preoperative evaluation revealed multisystem involvement but stable cardiorespiratory function. Airway assessment was remarkable for facial asymmetry. Informed consent was obtained. Anesthesia induction included a 1 mcg/kg dexmedetomidine bolus over 10 minutes, a TCI of remifentanil, ketamine, propofol, and rocuronium (20 mg). Nasotracheal intubation was performed with GlideScope videolaryngoscopy. Remifentanil and dexmedetomidine infusions and a low MAC of desflurane were used for maintenance. Multimodal analgesia included paracetamol (1 g), metamizol (1 g), and ketorolac (30 mg). Postoperative care prioritized monitoring for metabolic or neuromuscular complications, none of which occurred.

Discussion: General anesthetics disrupt mitochondrial bioenergetics and pose risk for metabolic stress and neuromuscular compromise in MDS patients. Both volatile anesthetics and propofol infusion should be minimized or avoided. Succinylcholine is contraindicated due to risks of hyperkalemia and myotonia, while nondepolarizing neuromuscular blockers must be cautiously dosed due to variability in effects2. We describe a case where dexmedetomidine and short duration agents were used successfully and safely. Multimodal analgesia minimized opioid use, reducing respiratory depression, and enhancing recovery. This case highlights the importance of individualized anesthetic plans for rare disorders with systemic impact.

References:

- 1. Mancuso M et al. Mitochondrial DNA depletion syndromes: a review. Neurology. 2021.
- 2. Dimmock D et al. Anesthetic considerations in mitochondrial diseases. Anesth Analg. 2019.

Learning points: And individualized plan is essential for MDS patients. Avoidance of volatile anesthetics and succinylcholine is key. The safety of dexmedetomidine in MDS patients should be further explored. Multimodal analgesia and tailored anesthetic approaches improve safety and recovery.

26AP02-4

Heart failure and obesity: the bariatric surgery dilemma

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Background and Goal of Study: In patients with obesity and chronic heart failure (CHF), weight loss improves functional capacity. Overall bariatric surgery (BS) is considered an effective and safe treatment. However, there is not clear evidence on patients with severe CHF. We aim to assess the incidence of postoperative complications (PPC) in patients with severe obesity and CHF having BS.

Materials and Methods: Single-center observational retrospective study in patients with body mass index (BMI)>35 kg/m² and CHF with systolic disfunction defined as left ventricular ejection fraction (LVEF)<50% having BS. We recorded demographic and clinical data and perioperative complications, as well as weight loss, functional capacity and LVEF 1-year after BS. The primary outcome was the incidence of PPC graded by Clavien-Dindo scale and comprehensive complication index (CCI). The secondary, length of hospital stay (LOS), and weight loss, LVEF and functional capacity 1-year after BS.

Results and Discussion: 80 patients were included in the analysis, 38 with CHF and 42 in control group. There were not differences in demographic and clinical characteristics (Table 1). Moreover, the overall incidence of postoperative complications and the CCI were not different between groups. Notwithstanding, CHF patients had higher rate of minor complications (Clavien-Dindo grades 1&2) and slightly longer LOS (4 ± 5 vs 3 ± 1 days) than control patients (p<0.05, each).

One year after, BS was effective with 27% reduction in BMI. CHF patients showed a 17% improvement in LVEF, and in 10 (25%) of those patients LVEF increase over 50%. Alongside, CHF patients ameliorated functional capacity with a 79% reduction in NYHA III, and a 50% decrease of MET<4.

Conclusion: BS is effective in patients with CHF with LVEF<50%. Although these patients have higher incidence of minor complications and slightly longer LOS, they showed a significant improvement in both LVEF, and functional capacity. These patients will benefit from having the BS in a high-volume center involving a multidisciplinary team to minimize complications.

	LVEF < 50	LVEF > 50	р
	(n 38)	(n 42)	value
Age (y.o.), Mean ± SD	56 ± 9	55 ± 9	0.541
Sex (Men/Women), n (%)	32 (84) / 6 (16)	30 (71) / 12 (29)	0.192
BMI (kg/m²), Mean ± SD	44 ± 6	45 ± 6	0.535
ASA III/IV, n (%)	32 (84)/ 6 (16)	40 (95)/ 2 (5)	0.141
Functional Capacity, n (%)			
NYHA I	6 (18)	2 (7)	0.477
NYHA II	14 (41)	12 (44)	
NYHA III	14 (41)	13 (48)	
LVEF, Mean ± SD	35 ± 9	58 ± 5	0.000
Patients with at least 1 minor			
complication(Clavien Dindo grades 1-2), n (%)	9 (24)	0 (0)	0.001
Patients with at least 1 major			
complication(Clavien Dindo grades 3a-5), n (%)	1 (3)	4 (10)	0.362
CCI, Mean ± SD	6 ± 14	4 ± 14	0.692
LOS, (days, Mean ± SD)	4 ± 5	3 ± 1	0.049

Table 1. Demographic and clinical characteristics, minor and major complications, CCI and LOS.

References:

Aryee, E. K., Ozkan, B., & Ndumele, C. E. (2023). Heart Failure and Obesity: The Latest Pandemic. In Progress in Cardiovascular Diseases (Vol. 78, pp. 43-48). W.B. Saunders. https://doi. org/10.1016/j.pcad.2023.05.003

26AP02-6

Postoperative pain management with opioid free intravenous pump infusion after sleeve gastrectomy - a case series

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Background: Effective pain management of morbidly obese patients after laparoscopic sleeve gastrectomy can be of great challenge for anaesthesiologists.

Case Report: We present two cases of bariatric patients who underwent laparoscopic sleeve gastrectomy. A 41-year-old female with a BMI of 48 kg/m² and an ASA physical status classification of II and a 40-year-old female with a BMI of 50 kg/m², also classified as ASA II.

Multimodal, opioid sparing, preemptive analgesia was provided. Magnesium sulphate (2,5gr), dexamethasone (8mg), dexketoprofen (50mg), fentanyl (100µg) and oxycodone (8mg) were given before skin incision.

Propofol and rocuronium were used for induction of anaesthesia and desflurane for maintenance. Intraoperative pain management included lidocaine (1mg/kg IBW/h) and esmolol infusion -according to sympathetic stimulation, along with remifentanil (50µg/ml) in low dose.

Intraoperative monitoring included ECG, SpO2, invasive BP, BIS and core body temperature. At the end of operation 1gr of paracetamol and 2mg of oxycodone was given in addition to wound infiltration with levobupivacaine 0.25%.

Postextubation an infusion pump of nonopioids was initiated (0,5ml/10kg IBW/h). It was a mixture of dexmedetomidine (100µg), lidocaine (1gr) and ketamine (100mg) in N/S (total volume 100ml) according to Mulier's protocol (Mulimix).

Additionally paracetamol (1gr) guid and ondansetron (4mg) bid were prescribed. Duration of infusion was approximately 55 hours while the patients were observed by the anaesthesia team guid. for possible side effects and pain management requirements. Patients were mobilized in the afternoon of the first postoperative day. No side effects were present, and no extra opioids were required, while VAS score remained below 3 during stay in PACU and throughout whole postoperative period.

Discussion: Use of Mulimix in these two morbidly obese patients proved to be an effective strategy in postoperative pain management. The need for opioids was eliminated and early mobilization was achieved. No side effects were recorded. A larger sample of patients should be recruited to solidify these results.

Reference:

Baek SY et al. Opioid-free anesthesia with a mixture of dexmedetomidine, ketamine, and lidocaine in one syringe for surgery in obese patients. J Int Med Res. 2020 Oct 28;48(10) Learning points: Opioid free postoperative analgesia with use of Mulimix can be an effective and safe alternative after laparoscopic sleeve gastrectomy.

26AP02-7

Preliminary results of the PRINCESS trial: Preoperative intermittent fasting to reduce insulin resistance

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Background and Goal of Study: Surgical procedures are known to induce a metabolic stress response, causing increased insulin resistance and hyperglycaemia, with associated postoperative complications. Nutritional strategies, such as time-restricted eating (TRE), have been suggested to improve insulin sensitivity after a short period of time. If proven, short-term preoperative TRE could compensate for the increased insulin resistance after surgery, reducing postoperative complications.

This study aimed to investigate whether two weeks of TRE reduced fasting state insulin resistance preoperatively compared to the control group.

Materials and Methods: The PRINCESS study is an open-label, single centre, randomised clinical trial in patients with no history of diabetes mellitus that underwent elective orthopaedic surgery. In the intervention TRE group, participants received instructions to eat during a self-chosen 8-hour period for 14 days preoperatively, with no restrictions on meal content. In the control group, no specific instructions were provided. At baseline, the day of surgery and the day after, fasting glucose, insulin and c-peptide blood values were measured and used to calculate the updated homeostatic model assessment of insulin resistance (HOMA2-IR). Food intake was assessed using diet journals. For this preliminary analysis we report insulin resistance at baseline and the day of surgery, presented as medians + IQR with between-group differences compared with Mann-Whitney-U tests.

Results and Discussion: Diet journals of the participants revealed self-reported compliance with the instructed 8-hour period for eating in the TRE group. The results of this analysis (60% of intended sample size) showed normal, not significantly different HOMA2-IR values at baseline for the control group 1.29 (0.77-1.46) and the TRE group 1.07 (0.82-1.33), p=0.66. Interestingly, in the TRE group, HOMA2-IR increased at the preoperative measurements, 1.54 (0.89-1.77), a change of 0.25 (0.02-0.30). However, in the control group this increase in HOMA2-IR was also present: 1.39 (0.79-1.64), a change of 0.06 (-0.07-0.40).

Conclusion(s): This analysis showed an increase of insulin resistance instead of an expected decrease after a two-week period of TRE. The diet journals will be analysed for the final results and might provide valuable insight in the meal contents in both groups.

26AP02-8

Inguinal white adipose tissue-derived mtDNA exacerbates myocardial fibrosis post-ischemia under obesity

J. Yang¹, Y. Deng², T. Li²

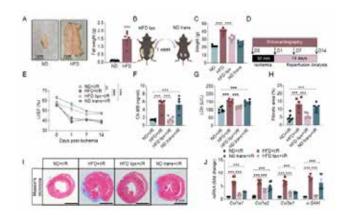
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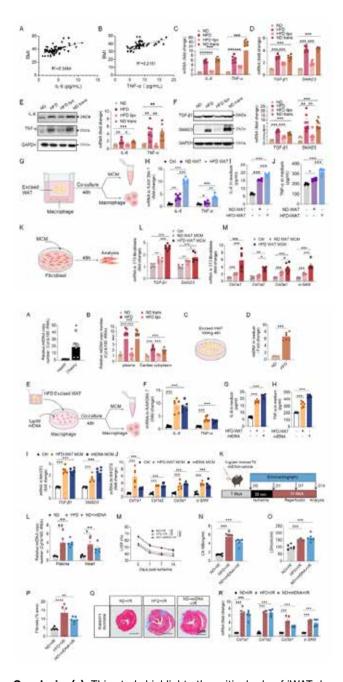
Background and Goal of Study: Obesity is associated with worsened outcomes following myocardial ischemia-reperfusion (I/R) injury. Inguinal white adipose tissue (iWAT) may play a role in cardiac damage, but the underlying mechanism remains not fully understood.

The aim of this study is to explore the role of iWAT in myocardial fibrosis following I/R injury in obesity.

Materials and Methods: A high-fat diet for 12 weeks was used to induce an obesity model. Myocardial I/R injury was created by ligating the left anterior descending coronary artery for 30 min followed by 14 days of reperfusion. Obese mice underwent iWAT removal surgery prior to the I/R procedure. Myocardial fibrosis was evaluated via Masson's trichrome staining, mtDNA levels were quantified via quantitative q-PCR.

Results and Discussion: Compared with control conditions, HFDinduced obesity led to more severe myocardial fibrosis following I/R injury, which could be alleviated by the removal of iWAT. Mechanistically, iWAT in obese mice promoted mtDNA release, which increased levels of IL-6 and TNF- α in hearts and plasma, and activated the TGF-β/SMAD3 signaling pathway.





Conclusion(s): This study highlights the critical role of iWAT-de-and activates the TGF- β /SMAD3 signaling pathway and exacerbates myocardial fibrosis in obese mice after I/R injury.

Cancer

27AP01-1

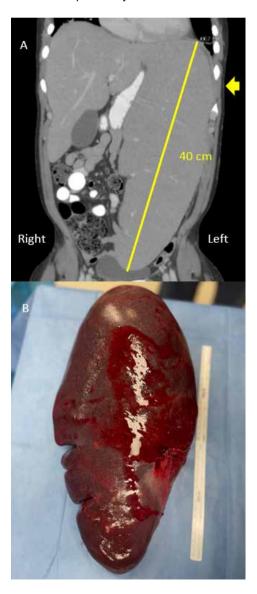
Perioperative management of massive splenomegaly in myelofibrosis: a case report

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Background: Massive splenomegaly (MS) is defined as a spleen weighing over 1000 grams, crossing the midline, or reaching the iliac crest. This report outlines the perioperative management of a patient with MS undergoing an urgent splenectomy.

Case description: A 43-year-old male, with a history of myelofibrosis, presented with abdominal pain, early satiety, and shortness of breath. His lab results revealed a white blood count of 106 x 10^9/L, platelets of 20 x 10^9/L, and hemoglobin of 7 g/dL. CT imaging confirmed massive splenomegaly (Figure 1), while PET-CT excluded pulmonary embolism.



The patient was admitted to the ICU for respiratory failure which was managed on high-flow nasal cannula. Since medical treatment for splenomegaly was ineffective, the patient underwent splenic embolization followed by open splenectomy. Intraoperative management included rapid sequence induction due to aspiration risk from gastrointestinal compression. A central venous catheter, radial arterial line, and large-bore intravenous lines were placed.

Perioperatively, the patient received several transfusions of red blood cells and platelets to maintain hemoglobin >8 g/dL and platelets >20 x 10^9/LT. The procedure was uneventful, and his cytopenias resolved immediately after splenectomy. Resected spleen measured 12 x 23 x 40 cm and weighted 3.8kg.

Discussion: This case highlights the need for urgent surgical intervention for myelofibrosis-related MS unresponsive to medical management.²

Perioperative planning must include careful assessment of coagulopathy, anemia and thrombocytopenia. Massive transfusion protocol and invasive monitoring was essential.

Conclusion: MS in myelofibrosis requires individualized perioperative management to address bleeding risks, coagulopathy, and thromboembolic concerns, optimizing surgical outcomes and patient recovery.

Learning points: MS presents significant challenges due to bleeding risks and associated coagulopathy. The enlarged spleen can sequester up to 20 times more red blood cells than a normal spleen, leading to severe cytopenias and necessitating intraoperative massive transfusions.

27AP01-2

tomosis).

Goal Directed Pulse Pressure Variation (PPV) guided intraoperative fluid administration in oral oncosurgery with free flap reconstruction - a retrospective case series analysis

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Background: Goal Directed Fuid Therapy (GDFT) based on minimally invasive dynamic monitoring is used for fluid optimization. Present retrospective observational study focuses on analyzing impact of Pulse Pressure Variation (PPV) based GDFT on blood Lactate, pH and free flap sugar levels as markers of tissue perfusion and flap health which has not been adequately reported in literature for oral oncosurgery with free flap (FF) reconstruction. Primary goal: Total Fluid Administered Intraoperatively, Blood Lactate, pH,Blood Sugar vs Flap Sugar (Post Microvascular Anas-

Secondary: Intraoperative Haemodynamics, Urine Output.

Objective: Flap viability at end of surgery.

Materials and Methods: Retrospective observation of anesthesia record from August 2023 to August 2024. Data collected-Demography, Free FlapType, Surgical Duration, Blood Loss, Fluid Transfused, Urine Output, PPV, Haemodynamics, Blood Lactate, pH, Blood Sugar, Flap Sugar.

Result: 28 oral malignancy patients met inclusion criteria. Age 55.36±11.08 years, ASA II,III. FreeFlap types ALT-17, RAFF-3, FFF-6. LD-1. DIEP-1. Surgical Duration 7.34±1.03hrs. PPV was maintained<13% with stable haemodynamics (Table1).

Total fluid transfused (4071.43 ± 37.32) Blood lactate ranged from 1.49 to 1.14 with significant P value between 1&3 (Table2). Blood pH was 7.37 to 7.38. Difference between flap sugar (149.93 ± 34.82) and blood sugar (144.43 ± 37.32) was minimal. All free flaps were healthy as per color, texture, pin prick at end of surgery.

	Baseline	10 min	60 min	120 min	180 min	240 min	300 min	360 min
PPV%	13.61	11.64	9.18	9.46	8.50	8.43	8.32	8.04
	±2.87	±2.78	±2.47	±2.35	±2.36	±2.38	±2.45	±2.56
SBP	123.86	111.25	106.21	110.86	113.57	116.43	114.39	115.29
mm/Hg	±17.89	±18.51	±12.99	±11.18	±10.48	±10.99	±10.54	±10.76
DBP	70.46	63.07	62.11	62.89	61.36	63.00	62.61	63.14
mm/Hg	±10.33	±12.11	±7.44	±6.95	±9.54	±7.42	±7.80	±8.48
HR,	79.39	78.36	75.50	75.00	74.14	73.89	74.21	73.86
bpm	±11.90	±10.76	±9.10	±9.76	±7.27	±8.11	±8.73	±7.77

Table 1: Intraoperative PPV and Haemodynamic Parameters

	After induction (1)	Middle of surgery (2)	Prior to end of surgery (3)	P value (1 vs 2)	P value (1 vs 3)	P value (2 vs 3)
Lactate, mmol/L	1.49 ± 0.63	1.22 ± 0.27	1.14 ± 0.28	0.025	0.004°	0.104
рН	7.37 ± 0.05	7.38 ± 0.06	7.38 ± 0.03	0.685	0.792	0.786

Table 2: Intraoperative Biomarkers values at different timepoints

Discussion: Our patients received GDFT based on PPV maintained below 13% as per departmental protocol which resulted in fluid transfused <5000ml, sufficient urine output. Tissue perfusion biomarkers were within normal range without signs of free flap vascular compromise.

Conclusion: This retrospective pilot case series highlights assessment of blood lactate, pH, free flap sugar under PPV based fluid therapy aiming for successful free flap in oral oncosurgery.

27AP01-3 Case report: management of a patient with port catheter line separation

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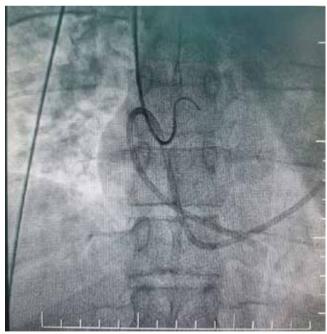
Background: Port catheter placement is frequently applied in oncology patients. However they have their own risks and complications. In this case report, we present the symptoms and management of a patient who had port catheter line separation.

Case report: A 24-year-old female patient diagnosed with ovarian sarcoma 2 years ago had a port catheter placed in an outer center clinic. After the catheter was used for 3 days, fluids from the port were not advancing and there was pain in the entry area. The patient had symptoms of dyspnea, pain when breathing and tachypnea about a year but no cause was established. The patient was than referred to us for a check of her port catheter. Scopy was performed and the catheter was seen, seperated from the entry level and advanced into the heart chambers, between right atrium and right ventricle (Figure 1).

The Cardiology Clinic was contacted and angiography was planned, the foreign body was removed with transjugular snaring under sedation (Figure 2). The removed object was made of polyurethane (PU). The patient refused any furher vascular intervention and was discharged from the hospital.

Discussion: Port catheters remain functional long-term with proper maintenance and quality materials, offering patient comfort and rarely causing complications like line rupture. The catheter dislodge was likely due to prolonged inactivity and its less flexible PU material, prone to breakage (1).





Reference:

1. Alzahrani K, Lejeune J, Lakhal W, Polyurethane versus silicone port a cath: What's going on at removal? J Pediatr Surg. 2018 Jul;53(7):1417-1419. doi: 10.1016/j.jpedsurg.2017.06.025. PMID: 28689888

Learning points: We have been using silicone catheters in our clinic for years and recommend regular checks for port catheters, preferably made of silicone for better flexibility and resistance to breakage.

Severe hypoglycemia in a non-diabetic patient with chronic subdural hematoma: Unmasking Doege-Potter syndrome

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Background: Chronic subdural hematoma (cSDH) is a common neurosurgical condition. However, its association with severe hypoglycemia in non-diabetic patients is infrequent. Doege-Potter syndrome (DPS) is a rare paraneoplastic syndrome causing persistent hypoglycemia due to solitary fibrous tumors (SFTs) secreting prohormone insulin-like growth factor 2 (IGF-II) (1). We report a case of a patient who presented with a cSDH and severe hypoglycemia, eventually linked to undiagnosed DPS.

Case report: An 85 year old female on dual antiplatelet therapy for recent coronary stent placement presented with headaches following a recent fall. A CT imaging revealed cSDH with mass effect, necessitating burr hole evacuation after decline of consciousness and a seizure.

Severe intraoperative hypoglycemia (21 mg/dL) was detected and treated with IV glucose boluses. Persistent postoperative hypoglycemia prompted further investigation. The patient reported systemic symptoms, including fevers, night sweats, dizziness, and 7 kg weight loss over a short period. Laboratory tests showed low serum insulin (<2.8 pmol/L) and C-peptide (0.01 nmol/L), excluding endogenous hyperinsulinism.

Elevated IGF-II (538 ng/mL) and suppressed IGF-I (<25 µg/L) confirmed non-islet cell tumor hypoglycemia. PET-CT identified a large hypermetabolic mass in the right lung, which was highly suspicious for malignancy.

A few days later, thoracotomy was performed for complete excision of a 1533 g encapsulated pleural mass. On histopathology, the diagnosis of SFT was confirmed. Hypoglycemia resolved postoperatively, confirming DPS as the underlying cause.

Discussion: This case emphasizes the diagnostic difficulties in identifying DPS, particularly when overshadowed by conditions such as cSDH. Previous case studies have demonstrated the link between DPS and recurrent hypoglycemia¹, but the presentation in a neurosurgical context is novel. Severe hypoglycemia can lead to seizures, delayed recovery, or permanent neurological deficits (1). Prompt recognition and tumor resection are essential to resolve hypoglycemia, prevent adverse effects, and improve outcomes.

References:

1. Ahluwalia N, et al. Doege-Potter Syndrome. Ann R Coll Surg Engl. 2015 Oct;97(7):e105-7.

Learning points: Severe hypoglycemia in non-diabetic patients with cSDH warrants investigation and may indicate other serious conditions such as DPS. Recognizing the underlying cause and prompt management are essential for optimal patient outcomes.

27AP01-5

The role of perioperative 80% FiO₂ in oncological recurrence and mortality: a 3-year follow-up study in colorectal cancer surgery

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Background: There is controversy regarding the use of perioperative high inspired oxygen fraction (FiO2>80%) to reduce the incidence of surgical site infections. Some authors have suggested that it could increase oncological recurrence and mortality!

The goal of this study was to assess whether perioperative 80% FiO2 increases oncological recurrence and mortality compared to standard therapy.

Materials and Methods: After approval by the ethics committee, we conducted a 3-year follow-up study of patients included in the previous TropO2 study².

This was a randomized controlled trial comparing the incidence of acute myocardial injury in elective colorectal surgery with the use of perioperative 40% FiO2 (control group) or 80% FiO2 (hyperoxia group).

We included only the oncological patients and recorded demographic data (sex, age, BMI, ASA status), intraoperative data (type and duration of surgery), and oncological data (tumor stage and postoperative adjuvant therapy).

Three years after surgery, we recorded the occurrence of oncological recurrence and mortality by reviewing hospital medical records or contacting patients if necessary.

Statistical analysis: t-test to compare means and chi-square test (\square^2) to compare proportions.

Results: We included only the oncological patients from the primary study (281 patients out of 403). Of these, 134 were assigned to the Control Group and 147 to the Hyperoxia Group.

There were no statistical differences in demographic, intraoperative, or oncological data.

After 3 years, we found a 19% incidence of oncological recurrence in the Hyperoxia Group versus 15% in the Control Group, but this difference was not statistically significant (p=0.36).

The 3-year mortality in the Hyperoxia Group was 15.6%, while in the Control Group it was 17.1%. This difference was also not statistically significant (p=0.73).

Conclusion: Although we observed a non-significant trend towards increased oncological recurrence in the Hyperoxia Group, mortality was not higher in this group compared to the Control Group.

Larger studies with more patients are needed to clarify this hypothesis.

References:

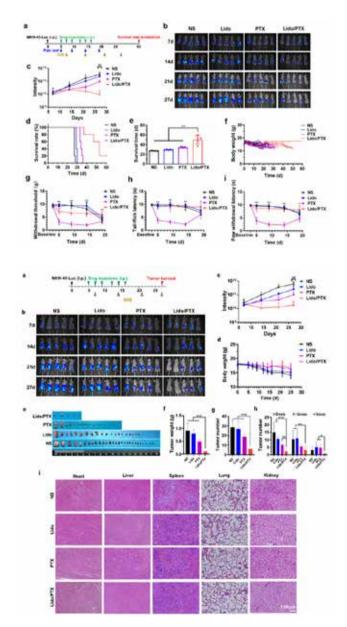
1. Meyhoff CS, Jorgensen LN et al. Risk of new or recurrent cancer after a high perioperative inspiratory oxygen fraction during abdominal surgery. Br J Anaesth. 2014 Jul;113:i74-i81. 2. Sadurni M, Castelltort L et al. Perioperative hyperoxia and myocardial injury after surgery: a randomized controlled trial. Minerva Anestesiol. 2023 Jan-Feb;89(1-2):40-47

Lidocaine enhanced antitumour efficacy and prevented hyperalgesia of intraperitoneal-suffusion chemotherapy in mice bearing metastatic gastric cancer

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Background and Goal of Study: Local anesthetics are increasingly used in cancer surgery, drawing attention to their potential antitumor effects. This suggests combining them with antitumor drugs to relieve chemotherapy pain and improve efficacy. However, there is limited pre-clinical evidence, which hinders their clinical use.

This study examines intraperitoneal chemotherapy for gastric cancer to assess the effectiveness of a lidocaine (LIDO)/paclitaxel (PTX) combination.



Materials and Methods: We first used human gastric cancer cells to investigate the antitumor activity and related mechanisms of the LIDO/PTX combination *in vitro*. Then we used mice with intraperitoneal drug suffusion to evaluate the efficacy of LIDO to prevent paclitaxel-induced hyperalgesia and related mechanisms. Lastly, in tumor-bearing nude mice we evaluated the synergistic antitumor activity and pain-relieving effect of the LIDO/PTX combination.

Results and Discussion: The LIDO/PTX combination exhibited synergistic antitumor activity by inducing apoptosis, inhibiting migration and invasion of gastric cancer cells. In animal models, the LIDO/PTX combination effectively inhibited growth and peritoneal metastasis of cancer.

Average survival time of the LIDO/PTX group was much longer than saline control (P < 0.001, 95% CI 15.64-29.96), PTX group (P < 0.001, 95% CI 13.44-27.76) and LIDO group (P < 0.001, 95% CI 8.643-22.96). Meanwhile, hyperalgesia caused by paclitaxel was effectively inhibited by the anesthetic and anti-inflammatory effect of LIDO.

Conclusion(s): Through intraperitoneal administration, lidocaine could effectively enhance antitumor efficacy and prevent chemotherapy-induced hyperalgesia. Conventional intraperitoneal perfusion chemotherapy could be strengthened by using lidocaine as a dual-functional adjuvant.

27AP01-7

Impact of enhanced recovery after surgery pathways on 5-year outcomes following elective colorectal surgery: insights from the POWER study

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Background and Goal of Study: Enhanced Recovery After Surgery (ERAS) pathways aim to optimize perioperative care in colorectal surgery, improving short-term outcomes. However, their impact on long-term outcomes, such as cancer recurrence and overall survival, remains unclear.

This study evaluates 5-year outcomes of patients undergoing elective colorectal surgery within the Postoperative Outcomes Within Enhanced Recovery After Surgery Protocol (POWER) Study.

Materials and Methods: This observational, multicenter study included 901 patients undergoing elective colorectal surgery, divided into ERAS (n=540) and non-ERAS (n=361) groups. A retrospective 5-year follow-up was conducted to assess cancer recurrence and overall survival. Additional data collected included demographic characteristics, ERAS compliance rates, and length of hospital stay. Kaplan-Meier survival curves and log-rank tests compared outcomes between groups, while multivariable regression analyses adjusted for confounders.

Results and Discussion: Baseline characteristics were similar between groups, with a median age of 68 years [IQR: 59-77] and 66.8% male patients. ERAS patients demonstrated higher compliance with perioperative protocols (median 72.7% vs. 54.5%,

p<0.01) and shorter hospital stays (median 6 vs. 8 days, p<0.01). Cancer recurrence rates over five years were not significantly different between groups (HR 0.91, 95% CI 0.68-1.22, p=0.53). Overall survival was also comparable (HR 1.14, 95% CI 0.88-1.49, p=0.32). ERAS pathways improve short-term recovery in elective colorectal surgery, including shorter hospital stays and higher compliance with perioperative protocols. However, no significant differences were observed in cancer recurrence or overall survival over five years.

Conclusion(s): These findings suggest that ERAS pathways optimize perioperative recovery without influencing long-term oncological outcomes. Further research is needed to explore strategies for enhancing long-term benefits in this patient population. References:

Ripollés-Melchor J, Ramírez-Rodríguez JM, Casans-Francés R, et al. Association Between Use of Enhanced Recovery After Surgery Protocol and Postoperative Complications in Colorectal Surgery: The Postoperative Outcomes Within Enhanced Recovery After Surgery Protocol (POWER) Study. JAMA Surg. 2019;154(8):725-736.

27AP01-8

Post pneumonectomized patient for robotic radical cystectomy anaesthetic concerns, a case report on perioperative strategy - overcoming challenges

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Background: Post Pneumonectomy Syndrome(PPS) is a rare late complication of Pneumonectomy, with patients presenting upto 20 years after the surgery¹. Concerns for anesthesiologists while managing PPS patients undergoing minimally invasive Robot Assisted Abdomino Pelvic Surgery(RAAPS) and intraoperative anesthetic approach is being highlighted.



Fig.1 Chest xray AP view

	75yr M, Body Mass Index- 30kg/m² Urothelial Carcinoma Bladder
HISTORY	Left Pneumonectomy 30 year back
	(Progressive Dyspnea 5 yrs, METS < 4)
	Left Nephroureterectomy 5 years back , TURBT
	PTCA to RCA
	Hypertensive, Diabetic, Hypothyroid
PROCEDURE	Robotic Assisted Radical Cystectomy(8 hours)
	B/L Pelvic Lymph Node Dissection (PLND)+ Ileal Conduit
EXAMINATION	MMPG - III
	Neck extension - Severely restricted
	Thoracic Scoliosis
	Chest - RR-24/min, Left thoracotomy scar + Flail segment, Right- Emphysematous
	SpO ₂ -93-94%(Room air)
	Breath Holding Time 12-14sec
INVESTIGATIONS	● ECG LAFB
	● ECHO55% EF
	O LVH
	- ···

- O LA compressed by descending aorta
- Spirometry

Severe Obstructive + Restrictive

- FVC-1.91L(55% predicted)
- FEV -1 29I (55% predicted)
- PEF- 4.04L/s(Z score -18.0)
- X-ray ChestScoliotic Dorsal Spine-Fig1
 - O Left overcrowding ribs
 - O Volume loss
 - O Opacification hemithorax

CECT Chest

Synostosis

- Volume loss in left hemithorax
- Insilateral cardio mediastinal shift
- Arch of aorta abutting lateral thoracic wall

ANESTHESIA PLAN

- Arterial line(serial ABG) PICC line, BIS
- USG guided L1-L2 epidural catheter dosed with 0.25% bupivacaine
- Videolaryngoscopy revealed markedly deviated, mildly compressed glottis POGO 30%
- ETT size 8.0mm was negotiated and fibreoptic visualization done to confirm lower end of ETT
- Ventilatory strategy Pressure Control Ventilation(PCV)Fig.2
- Peak Inspiratory Pressure(PIP) 25 cmH₂0
- Tidal Volume 350-400 ml
- RR 20-22, FiO2 0.4, MV 7-8 L
- Two hourly adjustment of I:E ratio1:1,1:1.4, 1:1.8,1:2 to avoid ventilation
- Steep Trendelenburg(45°), Intra Abdominal Pressure(IAP)12mmHq
- Hemodynamics- Systolic BP(110-140mmHg), Diastolic BP(70-80 mmHa).HR(75-85)
- Restrictive Fluid Therapy
- Blood loss -1.5L, 2 PRBC transfused

ARTERIAL BLOOD GAS ANALYSIS (ABG) pH/PaCO,/PaO2/ Lactate/FiO.

INTRAOPERATIVE 7.38 / 36 / 199 / 1.5 /0.5

4 HRS

8 HRS

INTRAOPERATIVE 7.35 / 35.8 /182 / 1.2 /0.5

POSTOPERATIVE 7.35 / 37.7 /141 /1.3 /0.35

POST EXTURATION 7 43 / 29 7 / 78 /1 5 /0 21

POSTOPERATIVE Flective Ventilation for 12 hr PCV

> PIP 17-18 cmH₂0, TV 350-400ml, RR 18-20, FiO₂ 0.4 weaned on CPAP ® extubated uneventfully Discharged from ICU on Day 3



Fig.2 Monitor with PCV setting.

Discussion: Anesthetic aimed at acheiving normocapnia during pneumoperitoneum and steep Trendelenburg's position in this single lung patient by optimizing Dead Space Ventilation/Tidal Volume(Vd/Vt) which was possible by shortening I:E ratio, was 1:1 initially every 2hr based on PaCO_a. PCV mode compared to Volume Controlled Ventilation allowed lower peak airway pressures with both higher compliance and higher clearance²

References:

- 1. Madariaga MLL, Mathisen DJ. Post Pneumonectomy Syndrome.
- 2. Shanghai Chest ;4:2020
- 3. Chiumello D, Coppola S. Ventilation strategy during urological and gynaecological robotic assisted surgery: a narrative review. Br J Anaesth.2023 Oct;131(4):764-74.

Learning points: Thirty years post pneumonectomy with progressive dyspnea of recent onset, ipsilateral severe mediastinal shift, marked dorsal scoliosis, deviated airway, moderately restricted and obstructed Pulmonary Function Tests (PPS) presented challenging scenario for RARC and successfully managed by personalized patient based approach for lung mechanics during steep Trendelenburg's position.

27AP01-9

Two lung ventilation for robotic McKeown's esophagectomy for patients with permanent pacemaker in lateral prone position - overcoming complex anesthetic challenges: a case report

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Background: Perioperative Permanent Pacemaker (PPM) failure due to electrolyte, acid-base disturbance and electromagnetic interference (EMI) can lead to hemodynamic compromise which gets more pronounced with creation of artificial capnothorax. Concerns for anesthesiologists while managing these patients undergoing Robot Assisted Mckeown's Esophagectomy (RAMIE) is being highlighted

Case Report:

64 year Male 50 kg Body Mass Index-20.4 kg/m² Carcinoma Mid thoracic Esophagus

TATION

PROCEDURE

EXAMINATION

CLINICAL PRESEN- Complaints - Progressive dysphagia X 4 month

Weight loss (7kg)

Hoarseness of voice X 1 month

History- St.Jude MR Compatible Pacemaker insertion 3 months back (Sick Sinus Syndrome) ®

Neoadjuvant Chemoradiotherapy (CROSS PROTOCOL) Paclitaxel+Carboplatin 5

Radiotherapy- 41.4 Gy /23#

Robotic Assisted Minimally Invasive Mckeown's esophagectomy(RAMIE) with Feeding

Left Lateral decubitus with 45°prone(thoracic phase)

Duration 6 hours

PR-64/mt,BP-100/60 mmHg

Chest-Left infraclavicular pacemaker MMPG-II. normal neck movements Breath holding time - 28 sec

INVESTIGATIONS

X-ray Chest (Fig.1)

 CECT Chest-Mid thoracic esophagus shows mild circumferential thickening involving 3 cm length at D6-7 level

fibrocalcific changes in upper lobe left lung with bronchiectatic changes

- DL Scopy- left vocal cord immobile
- Spirometry normal study
- Bronchoscopy-No compression, tracheal infiltration
- ECG Atrial paced rhythm, HR 60/mt
- Tread Mill Test positive (prior to PPM) insertion for provocable myocardial

(ST depression, T inversion in v3-v6) at 94% target heart rate(147 bpm)

■ ECHO - 58% EF

No regional wall motion abnormalities at rest, peak exercise

Coronary angiography - normal study

ANESTHESIA PLAN

- Pacemaker Interrogation and programming (DDDR to DOOO mode) on day of surgery
- Defibrillator, Transcutaneous pacing equipment kept ready in OT
- ECG monitor set on diagnostic mode
- Arterial line(serial ABG), continuous Cardiac Output monitoring (Vigileo) BIS, Core body Temperature
- PICC line avoided for possibility of interference with pacing leads L1-L2 epidural catheter dosed with 0.25% bupiyacaine
- ANESTHESIA

Inj Fentanyl+Propofol+Atracurium ®

Single Lumen Endotracheal Tube(SLET) 7.5mm introduced(CL grade II)

- Maintanence-O, +Air+Sevoflurane+Propofol+Atracurium infusion (BIS guided)
- Two lung Ventilatory(TLV)-Volume Control Ventilation(VCV) in supine position
- Tidal Volume(TV) 500ml,RR-12,Peak Inspiratory Pressure(PIP) 16 cmH₂0
- Patient positioned in left decubitus with 45° prone after padding pressure points Artificial Capnothorax®CO₂ insufflation started at 5L/mt and increased gradually
- to 15L/mt at controlled pressure of 6mmHg(Fig.2) Da Vinci Robot docking done for thoracic phase of surgery
- Duration 2 hours
- Tidal Volume- 400 ml,RR 16-18/mt adjusted to maintain EtCO₂ 35-40 mmHg,
- Supine® hyperventilated to correct respiratory acidosis
- Hemodynamics MAP maintained 75-80mmHg under low dose vasopressor support
- Goal Directed Fluid Therapy(GDFT)-Stroke Volume Variation, Cardiac Output (CO)based(VIGILEO): Target SVV (8-12) Fig.2 Fluid intake-1.5L Crystalloid+0.5L
- BIS(40-60)
- Blood loss-200 ml
- Surgical considerations- Robotic harmonic for tissue cauterization

ARTERIAL BLOOD GAS ANALYSIS (ABG)& Haemody7.43/36.3/95.9/1.5/0.2/137/3.8/1.1 7.25/ 53.2/ 96.3/ 1.2/0.5/140/4.1/1.0

namics (Respiratory acidosis evident due to surgical emphysema) SVV

nH/PaCO /PaO2/ Lactate/FiO_/Na+/ 14 K+/Ca+2

11 BASELINE ® 10

INTRAOPERATIVE ® CO

(Before desufflation of 4.5 capnothorax) 5.0

Baseline/ Capnothorax5.1 / 4hrs / 6hs ®

POSTOPERATIVE POCUS lung to assess basal atelectasis in both lungs@Recruitment maneuver@Lung expansion confirmed@Patient Reversed and extubated in operation theatre

Pacemaker reprogrammed in ICU

Surgical emphysema right chest extending upto right shoulder resolved on Day 2

Shifted to ward on postoperative Day 3

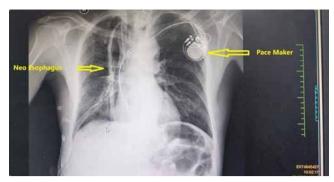


Fig1-Chest Xray with PPM, neoEsophagus



Fig.2-Haemodynamic monitor,BIS,screen

Discussion:TLV with SLET is associated with higher oxygenation during thoracoscopic phase of MIE than OLV using DLT/Bronchial Blocker¹. The hemodynamic changes related to artificial capnothorax (pneumothorax, surgical emphysema) are exaggerated in presence of PPM in these cardiac compromised patients which has to be avoided by SVV guided fluid therapy, controlled insufflation pressure upto 8mmHg and serial ABG for pH/PaCO₂/PaO₂/Lactate/Na¹/K¹/Ca¹²

References:

1. Cai L, Li Y et al. Better preoperative outcome in thoracoscopicesophagectomy with two lung ventilation in semi-prone position. *J Thorac Dis* 2017;9:117-22

Learning points:Literature search could not guide regarding anesthetic management of patient with PPM undergoing robotic thoracic surgery. Our case focuses on successful intraoperative anesthetic management of such a patient using SLET with artificial capnothorax, meticulous haemodynamic and respiratory mechanics monitoring.

27AP01-10

Anesthesia management for pheochromocytoma but with a twist, literally

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Background: Situs inversus totalis is a rare congenital variant characterized by the transposition of abdominal and thoracic organs contralaterally to their anatomical position. It is mostly asymptomatic but can also occur with cardiovascular, respiratory or gastrointestinal malformations.

Pheochromocytoma is a catecholamine-producing neuroendocrine tumor originating in the adrenal medulla. The typical presentation includes hypertension, headaches and palpitations. More often it is diagnosed accidentally on imaging scans carried out for another reason. Given the high risk of perioperative cardovascular complications, hemodynamic stabilization is essential.

Case Report: We present the case of a 74-year-old woman with a history of *situs inversus totalis* and pheochromocytoma of the left adrenal gland.

The patient underwent a left adrenalectomy by laparotomy under combined general anesthesia (intrathecal morphine and total intravenous general anesthesia), after adrenergic blockade started 5 months before the surgery in collaboration with an endocrinologist.

Due to the suspected invasion of the liver parenchyma and inferior vena cava, the collaboration of a hepatobiliary surgeon from another hospital was requested and the blood bank was contacted in advance.

The intraoperative period was marked by tensional lability, requiring boluses of phentolamine and labetalol, followed by phentolamine infusion until the tumor was excised and then noradrenaline infusion (max 0.33mcg/kg/min).

The post-operative period took place in an intensive care unit where vasopressor support was suspended 24 hours after surgery and was uneventful.

Discussion: The combination of these rare pathologies, which in themselves are complex to manage perioperatively, creates an unusual and challenging scenario for anesthesiologists, rarely described in the literature. Adequate management of cases as complex as this one can not be studied in controlled trials and are, therefore, dependent on case reports that describe successful outcomes like the one described above.

Reference:

Koç A., et al, Anaesthesia recommendations for Situs inversus totalis. Orphananesthesia. 2020;1–4.

Learning points: The combination of uncommon pathologies represents a challenge for the anesthesiologist, benefiting from timely preparation and a multidisciplinary team; Hemodynamic stabilization of a patient with pheochromocytoma is essential; The *situs inversus totalis* has an important impact on the anesthetic approach.

Irreversible electroporation for advanced tumors: An anesthesiologist's challenge!

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Background: Irreversible electroporation (IRE) is a promising technique for unresectable tumours which involves tumour ablation by delivering short pulses of extremely high voltage electrical current via electodes placed within tumour. It is essential to know the anaesthesia implications of IRE as it presents unique challenges to anaesthesiologist.

This is the case series of 3 percutaneous IRE cases in an Interventional radiology suite in a tertiary care oncosurgical centre.

Case Report: The first two cases of IRE were done in elderly patients with multiple comorbidities whereas the third patient was a 12 year old girl.

Second patient was a 68-year-old lady who was found to have left bundle branch block with low cardiac contractility. GA was administered to all three patients and neuromuscular monitoring was used to maintain deep muscle relaxation during ablation. Accusync device was used to deliver synchronized IRE pulses within the refractory period of heart.

Hypertension and tachycardia during electrical stimulation was managed by intermittent boluses of propofol, antihypertensives and fentanyl. Our patients experienced ventricular ectopics which were benign and short-lasting.

Discussion: Life threatening arrhythmias have been noted in literature when the tumours are in close proximity to heart. However, cardiac synchronization of current has shown to reduce its incidence. Apart from occasional ectopics and hypertension, our patients had an uneventful periprocedural course.

Majority of IRE procedures are done in radiology suite with CT guidance with limited space and resources. These factors present additional anaesthesia implications of anaesthesia in remote locations.

References:

K. Nielsen, H. J. Scheffer, J. M. Vieveen, A. A. J. M. van Tilborg, S. Meijer, C. van Kuijk, M. P. van den Tol, M. R. Meijerink, R. A. Bouwman, Anaesthetic management during open and percutaneous irreversible electroporation, *BJA: British Journal of Anaesthesia*, Volume 113, Issue 6, December 2014, Pages 985–992

Learning points: IRE is an attractive and safe option for surgically inoperable tumours. These patients aften cannot be completely optimized due to advanced disease or coexisting illnesses.

The procedure requires meticulous planning, a thorough understanding of the critical steps involved in IRE, and seamless coordination between the interventional radiologist, anesthesiologist, and bioelectric engineer to ensure its successful execution.

27AP01-12

Preoperative iron deficiency and outcomes in colorectal cancer surgery: preliminary results from the ID-COLO study

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Background and Goal of Study: Patients with colorectal cancer are highly susceptible to iron deficiency anaemia (IDA), a significant risk factor for perioperative complications, including increased in-hospital morbidity, delayed recovery and reduced quality of life. Latent iron deficiency (IDL), often unrecognised, may predispose patients without laboratory-confirmed anaemia to adverse perioperative outcomes.

The study aims to evaluate whether IDL increases perioperative morbidity risk and assess the diagnostic potential of red blood cell indices in identifying patients who might benefit from preoperative iron supplementation.

Materials and Methods: A prospective, observational cohort study (NCT06276140) was conducted, including patients undergoing radical colorectal cancer surgery. Participants were categorised into one of three groups based on preoperative laboratory analyses: IDA; IDL; and control group (CG) without iron deficiency and anaemia.

Overall morbidity during the hospital stay was assessed using the Comprehensive Complication Index (CCI), while recovery quality was evaluated on the first, second and fifth postoperative days using the 15-item Quality of Recovery scale (QoR-15). Red blood cell indices were derived from complete blood count parameters taken one day prior to surgery. Data analysis was conducted employing Student's t-test and ANOVA.

Results and Discussion: A total of 62 patients were included, with an IDA incidence of 29% and IDL incidence of 21%. Patients with IDA exhibited significantly higher CCI values (39.59±10.68 vs 29.17±12.75; p=0.009) and lower QoR-15 scores on the fifth postoperative day (109.11±20.45 vs 123.19±15.52; p=0.011) compared to the CG. No statistically significant differences in overall in-hospital morbidity or patient-reported recovery quality were observed when comparing IDL to IDA or CG.

While notable differences in red blood cell indices were evident between IDA and CG, RDW, Shine and Lal, and Ricerca indices showed statistically significant differences between IDA and IDL as well.

Conclusion(s): Although IDL was not associated with a higher risk of in-hospital morbidity or delayed recovery after colorectal cancer surgery, the small sample size may have limited statistical power. Red blood cell indices such as RDW, Shine and Lal, and Ricerca indices show promise as diagnostic tools for identifying patients who could benefit from preoperative iron supplementation, warranting further investigation.

Analgesia in radical mastectomy. Before and after erector spinalis plane block

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Background and Goal of Study: In our hospital, analgesia for breast surgery has traditionally been performed using a combination of NSAIDs and morphine, obtaining acceptable results. However, the development of ultrasound-controlled regional blocks has brought about a major change in the management of these patients.

Specifically, the erector spinae block (ESP) has meant a significant change in the way of approaching this type of surgery, improving the anesthetic and analgesic quality.

Materials and Methods: We performed a retrospective analysis of 40 patients undergoing radical mastectomy.

The common procedure for both groups was:

- Premedication: Midazolam 2 mg, Ranitidine 50 mg, Dexamethasone 8 mg.
- Induction and maintenance: sevoflurane + fentanyl + rocuronium.
- Postoperative analgesia: Paracetamol 1 g alternating with Dexketoprofen.
- Rescues with Tramadol 100 mg and Dolantine 50 mg.

The difference between groups was that half of them received ESP at T4 level with 25 ml of 0.5% ropivacaine 20 minutes before the intervention.

We evaluated: hemodynamic stability during surgery, the dose of fentanyl administered, the need for analgesic rescues and the patient's level of comfort (scale 0-10) according to the nurses in the recovery room and the surgeon the day after the intervention. **Results and Discussion:** The ESP group showed greater hemodynamic stability, requiring a lower amount of intraoperative fentanyl and subsequent analgesic rescues. The comfort of the patients was similar in both groups of patients according to the assessment made by the nurses during the first 24 hours and by the surgeon the day after the intervention.

	IV analgesia (n=20)	ESP block (n=20)
Hemodinamic stability (n)	12	18
Lengh of surgery (min)	180	195
Intraoperative fentanyl (mcg)	400	300
Need for rescue in recovery room (n)	12	4
Need for rescue in hospital room (n)	10	4
Comfort according to nursing (0-10)	7	9
Comfort according to surgeon (0-10)	7	8

Conclusion(s): ESP block offers some advantanges in front of classic analgesia: less use of fentanyl with greater hemodynamic stability and less needing of rescue analgesia in the postoperative period.

These results, although not very valuable due to the number of patients, encourage our search for the optimization of analgesia in these patients.

Brain: Neuro-anaesthesiology and Intensive Care

31AP01-1

Craniotomy and partial resection (Debulking) of a giant pretroclival meningioma with intraoperative continuous hemodialysis: a case report, anesthesiology and resuscitation. Sant Pau Hospital

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Background: This case highlights the management of a patient with chronic kidney disease (CKD) on intermittent hemodialysis (IHD) undergoing resection of a giant cerebellopontine angle (CPA) meningioma. Preoperative IHD was complemented with intraoperative continuous veno-venous hemodialysis using citrate anticoagulation to optimize homeostasis during this complex sur-

Case report: A 48-year-old male, ASA IV, with poorly controlled hypertension, chronic anemia, and undiagnosed CKD on IHD presented with decreased consciousness, leftward oculocephalic deviation, and mild right hemiparesis during an IHD session. MRI revealed a giant CPA meningioma with brainstem compression, infratentorial midline shift, right tonsillar herniation, and obstructive hydrocephalus, necessitating ventriculoperitoneal shunt placement.

Preoperative assessment showed cardiac comorbidities, including left ventricular hypertrophy, moderate aortic insufficiency, mitral valve disease, and pulmonary hypertension. Persistent fluid overload despite thrice-weekly IHD led to nephrology consultation and an increased frequency of dialysis. Considering the tumor's size, underlying conditions, and surgical complexity, intraoperative continuous hemodialysis with citrate was planned.

General anesthesia was administered, and the procedure lasted 8 hours. Intraoperative events included transient motor evoked potential loss, resolved with norepinephrine infusion, and a singleunit red blood cell transfusion for estimated blood loss of 500cc. Hemodialysis was uneventful.

Discussion: Meningiomas are typically benign but can compress critical structures. Surgical goals aim for maximal safe resection without compromising the quality of life. Intraoperative hemodialysis controlled intracranial hypertension, managed fluid balance, and minimized metabolic derangements, critical in a patient with significant renal and cardiac comorbidities.

Conclusions: The integration of intraoperative continuous hemodialysis represents a promising strategy for patients with CKD undergoing long-duration surgeries, particularly those with additional comorbidities.

Current gaps in guidelines for managing dialysis timing and intraoperative homeostasis underscore the need for further research into optimizing outcomes for this high-risk population.

31AP01-2

Intraoperative ischemic stroke: a case of complex etiology and remarkable neurological recovery following oncological surgery

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Background: Perioperative stroke is an uncommon complication, with an incidence of 0.1 to 0.8% (1) following non-cardiac and non-neurological surgeries. This case report describes an ischemic stroke of multifactorial etiology after a challenging oncological procedure.

Case report: A 62-year-old female with a history of hypertension, iron-deficiency anemia (preoperative hemoglobin level of 10 g/ dL), diabetes, and a transient ischemic attack (TIA) two months ago, underwent an elective radical hysterectomy and bilateral salpingo-oophorectomy for ovarian carcinoma.

The patient received general anesthesia combined with epidural analgesia. Intraoperative blood loss amounted to 1500 mL, requiring transfusion of three units of packed red blood cells (PRBCs), with a final hemoglobin level of 8.9 g/dL. Hemodynamic stability was maintained, although some episodes of hypotension occurred, which were effectively managed with vasopressors and fluid therapy. The total surgical time was five and a half hours. The patient was extubated in the operating room without complications.

In the immediate postoperative period, the patient exhibited somnolence, aphasia, and right-sided hemiparesis. A CT scan revealed multiple ischemic infarcts in both hemispheres, consistent with a perioperative stroke of multifactorial origin. Probable contributing factors included recent TIA, hypoperfusion, and a hypercoagulable state associated with cancer. Transthoracic echocardiography excluded a cardioembolic source.

Despite a severe initial presentation (NIHSS: 25), the patient had a surprisingly favorable recovery, with a final NIHSS score of 10. Discussion: This case underscores the role of multiple factors in the development of perioperative stroke. The literature indicates that prior TIA significantly increases the risk, particularly in patients undergoing surgery within six months of the event (1;2). The detection of postoperative stroke and the unexpectedly positive neurological outcome are noteworthy findings.

References:

1. Gelb AG, et al. Perioperative Stroke Following Noncardiac, Noncarotid, and Nonneurologic Surgery, UpToDate, 2024. 2. Benesch C, et al. Perioperative Neurological Evaluation and Management to Lower the Risk of Acute Stroke in Noncardiac, Nonneurological Surgery. Circulation. 2021.

Learning points:

- · Perioperative stroke has a multifactorial etiology and needs strict monitoring.
- Elective surgeries should be postponed for at least three months following a stroke.

Electromyogram (EMG) waves do not affect substantially BIS Vista™ monitoring parameters in terms of SEF95 and different frequency range bands

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Background and Goal of Study: Depth of Anaesthesia (DOA) monitors might be affected by several factors (environment. patient status or drugs). It is said that neuromuscular blockers (NMB), lack of it and NMB antagonism alter DOA monitoring due to electromyogram (EMG) interferences. On the other hand, some studies suggest that EMG activity is thus necessary to reach high BIS Index values.

Our study aims to demonstrate that EMG does not alter significantly DOA (using BIS Vista™) measurements

Materials and Methods: In patients receiving NMB continuous infussion (Rocuronium bromide), we antagonized NMB administering 2 mg.kg-1 Sugammadex under stable anaesthetic concentrations once the surgical procedure was finished. Then, we compared BIS Vista™ measurements (including BIS Index, SEF95 and different frequency range electroencephalogram [EEG] waves) every 2 minutes from baseline to 6 minutes after Sugammadex administration. Afterwards, we designed a model adjusting SEF95 and EEG frequency bands by EMG.

Results and Discussion: We present our results in 2 ways, Model 1 is an unadjusted model showing raw data; Model 2 is adjusted for EMG. Table 1 shows our results compared to baseline in both models; neither of the p values derived from these coefficients lost statistically significancy, nor gained it.

Frequency			Time f	rom sugammad	ex administrat	ion (min)
band [Hz]			-2-0	0-2	2-4	4-6
05505	Model 1	β coefficient (95% CI)	Reference	0.09 (-0.15 to 0.32)	0.29 (0.05 to 0.52)	0.71 (0.47 to 0.94)
SEF95	Model 2	β coefficient (95% CI)	Reference	0.08 (-0.15 to 0.32)	0.29 (0.06 to 0.52)	0.74 (0.49 to 0.98)
Delta	Model 1	β coefficient (95% CI)	Reference	136 (-115 to 387)	-223 (-474 to 28)	-527 (-778 to -276)
[1,4 Hz]	Model 2	β coefficient (95% CI)	Reference	127 (-124 to 377)	-220 (-470 to 31)	-468 (-730 to -206)
Theta	Model 1	β coefficient (95% CI)	Reference	65 (-113 to 242)	65 (-113 to 242)	65 (-113 to 242)
[4, 8]	Model 2	β coefficient (95% CI)	Reference	63 (-114 to 241)	65 (-112 to 243)	-119 (-305 to 68)
Alpha	Model 1	β coefficient (95% CI)	Reference	-43 (-296 to 209)	-56 (-308 to 196)	-47 (-299 to 205)
[8, 14]	Model 2	β coefficient (95% CI)	Reference	-37 (-288 to 216)	-58 (-310 to 193)	-93 (-358 to 171)
Beta	Model 1	β coefficient (95% CI)	Reference	49 (-43 to 141)	93 (1 to 185)	208 (116 to 300)
[14, 35]	Model 2	β coefficient (95% CI)	Reference	50 (-42 to 142)	93 (1 to 185)	201 (104 to 298)

Conclusion(s): In reversing NMB, Sugammadex increases EMG activity. Adjusting BIS Vista™ derived results for EMG shows superposable data in both models. This finding might be interpreted as EMG does not affect substantially BIS Vista™ derived results in terms of SEF95 and different EEG frequency bands (delta, theta, alpha and beta).

Reference:

Choi JB, Na SH, Lee SY et al. Suxamethonium induces a prompt increase in the bispectral index. Medicine (Baltimore), 2017 Apr:96(16):e6670.

Acknowledgements: Dr. Miguel Valencia

31AP01-4

Sugammadex administration under steady anaesthetic conditions decreases delta frequency range activity and increases beta frequency range activity in BIS Vista TM monitoring

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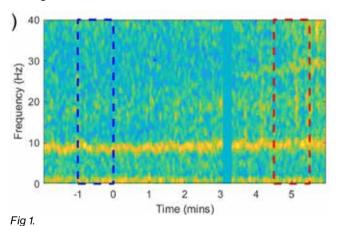
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Background and Goal of Study: Neromuscular blockers (NMB) and NMB reversal agents such as sugammadex are said to affect Depth of Anaesthesia (DoA) monitors due to electromyographic waves interferences. Several cases reported early arousal from anaesthesia after reversing NMB despite the fact that sugammadex does not cross blood-brain barrier (BBB).

Materials and Methods: We monitored DoA using BIS Vista™ in a patient receiving 2 mg.kg⁻¹ Sugammadex accordingly to Sugammadex information sheet⁷ under stable anaesthetic and haemodynamic conditions once the surgical procedure was finished. We then compared changes in frequency range bands after downloading BIS Vista™ data.



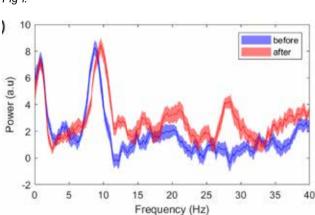


Fig 2.

Results and Discussion: When comparing both DSA and frequency range bands power baseline period (minute before sugammadex administration) and 4.5-5.5 min period after sugammadex administration, we observe an increase in frequency after sugammadex administration (Fig 1). We also observe a decrease in delta range frequency (0-4 Hz) and a beta range frequency (12-40 Hz) increase after sugammadex (Fig 2). These findings are compatible with a lighter anaesthesia stage or an anaesthesiaemergency pattern.

Conclusion(s): BNM reversal agents not crossing BBB, such as sugammadex, produce an increase in frontal EEG power frequency when comparing baseline measurements to 4.5 to 5.5 min after sugammadex in DSA. It also produces a decrease in delta frequency range (0-4 Hz) and an increase in beta frequency range (12-40 Hz) when comparing -1 to 0 and 4.5 to 5.5 periods. These findings are compatible with a lighter anaesthesia stage under steady anaesthetic conditions.

Acknowledgements: Dr. Miguel Valencia

31AP01-5 Perioperative vision loss following spinal surgery: a case report

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Background: Perioperative vision loss (POVL) is a rare complication following non-ophthalmological surgery. Awareness of POVL and quality of evidence on prevention and management is limited.

Case report: A 72-year-old male with a history of coronary artery disease, hypertension, heart failure, dyslipidemia, and obesity, ASA class III, was admitted for lumbar laminectomy with fusion at L3-5 level. Surgery was performed in a prone position under general anesthesia.

The patient's eyes were carefully taped closed. The face was placed on a foam head cushion, MAP was maintained >65mmHg. The surgery lasted 4h, blood loss - 500 ml. The patient was transferred to the postanesthesia ward, alert and stable.

On postoperative day one, the patient complained of vision loss in his left eye, which had persisted since emergence from anesthesia. Fundoscopic exam showed retinal vasculopathy, sclerotic lesions, macular pallor and a cherry-red spot indicative of central retinal artery occlusion (CRAO). Cerebral CT angiography and MRI showed no specific changes. No treatment options were available due to delayed diagnosis.

Further postoperative course was normal, but unilateral vision loss was permanent. A review of older medical records revealed documented transient ischemic attack in the vertebrobasilar region, significant cerebrovascular atherosclerosis and bilateral retinal angiosclerosis.

Discussion: POVL incidence after spinal surgery is 0.09%, mostly attributed to ischemic optic neuropathy or CRAO. Prolonged surgery (>6h), high blood loss, eye compression, hypotension and elevated intraocular pressure are associated with POVL risk [1]. Our patient's history of vascular diseases and prone positioning may have contributed to the development of CRAO despite uneventful surgery.

Notably, initially the patient attributed impaired vision to the perception that the left eyelid was in a closed position and did not express any complaints. In the acute phase of CRAO, thrombolytic therapy and hyperbaric oxygen therapy may be attempted: however, an early recognition of this complication is crucial [2-3].

References:

- 1. https://www.ncbi.nlm.nih.gov/books/NBK580561/
- 2. https://pubmed.ncbi.nlm.nih.gov/36639057/
- 3. https://pubmed.ncbi.nlm.nih.gov/34140653/

Learning points: Careful identification and information of patients at high POVL risk is necessary. Awareness of POVL risk may lead to better prevention, timely diagnosis, and treatment before the vision loss becomes irreversible.

31AP01-6

Associations between Spectral Edge Frequency (SEF-95) and oscillatory and aperiodic EEG dynamics during isoflurane anaesthesia

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Background and Goal of Study: During isoflurane general anaesthesia, the electroencephalogram (EEG) is primarily constituted by strong aperiodic activity together with delta (0.5 - 4 Hz) and alpha (8 – 12 Hz) oscillations. The Spectral Edge Frequency (SEF) is the frequency under which 95% of the spectral power lies, and is often used to estimate a patient's brain state, within and between patients.

Although SEF is displayed on multiple commercial monitors, it is not known to what degree it correlates with the clear aperiodic, delta and alpha power shifts that occur during anaesthesia.

Materials and Methods: In 289 patients, taken from the first 300 patients of the EPOCAS study, we determined SEF and 6 key spectral parameters (spectral slope and intercept, peak delta power, peak and oscillatory alpha power, with peak alpha frequency) which were then used to calculate Pearson's correlation coefficients against SEF over time for the pre-bypass period.

Results and Discussion: The median population SEF value was 9.1 Hz. Median spectral parameters were: slope -0.90 dB/Hz; intercept 7.4 dB; delta power 23.1 dB; alpha (peak power) 13.3 dB, alpha (oscillatory) 13.3 dB; alpha frequency 8.8 Hz.

Figure 1 shows population histograms of Pearson's Correlations Coefficients for each spectral parameter against SEF. Vertical lines represent the median correlation coefficients.

Conclusions: Peak delta power and spectral (aperiodic) slope had the highest median correlation values with SEF, and are thus likely to be the strongest determinants of SEF. Peak alpha power, alpha frequency and spectral offset were less strongly correlated with SEF. Accurate simulations of clinical EEG (with realistic aperiodic, delta and alpha power changes in accord with our results) will be required to confirm the precise causal effect of each spectral parameter on SEF individually.

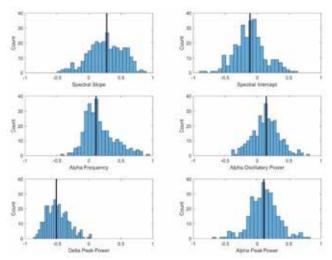


Figure 1: Population histograms of Pearson's Correlations Coefficients for each spectral parameter against SEF. Vertical lines represent the median correlation coefficients.

31AP01-7

Age-dependent electroencephalographic pattern during remimazolam anaesthesia

Y. Song¹

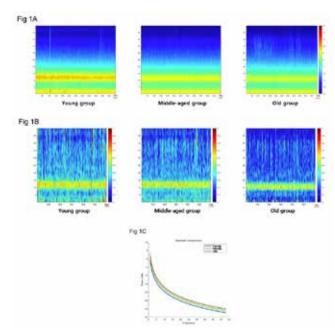
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Background and Goal of Study: Despite the potential of remimazolam as a safe and promising anaesthetic agent, the scarcity of electrophysiologic knowledge across different age groups limits its use in geriatric patients. While a recent study reported electroencephalographic (EEG) features during the peri-induction period in elderly patients, age-specific distinctions remain unexplored.

Materials and Methods: We analysed EEG data from 70 patients who received remimazolam as the primary anaesthetic. Patients were divided into three age groups: young (20-45 years), middleaged (45-65 years), and old (65 years and older) groups. Frontal electrode power spectrograms, inter-hemispheric coherence, and aperiodic offset and exponent values were assessed during anaesthetic maintenance prior to surgical incision. Linear regression was performed to examine age-related trends in computed EEG parameters, and group comparisons were conducted using ANOVA.

Results and Discussion: With increasing age, delta, alpha, and beta band power during remimazolam anaesthesia significantly decreased. Coherence in the delta, alpha, and beta bands also negatively correlated with age. Group comparisons revealed significantly lower alpha and beta oscillatory power in the old group compared to the young and middle-aged groups (Fig 1A).

The elderly group also exhibited significantly reduced delta, theta, alpha, and beta coherence compared to the young group (Fig 1B). Additionally, the aperiodic offset was significantly higher in the young group compared to the middle-aged and elderly groups (Fig 1C). Burst suppression was rare across all age groups.



Conclusion(s): EEG spectrograms, coherence analyses, and aperiodic measures revealed age-specific distinctive features during remimazolam anaesthesia. Leveraging unprocessed EEG with appropriate analytical approaches may enhance individualized anaesthetic management, particularly in geriatric patients, ensuring safer and more effective use of remimazolam.

31AP01-8

Steep Trendelenburg does not affect Bispectral Index measurements using BIS Vista™ monitor after 30 minutes of positioning

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Background and Goal of Study: Depth of Anaesthesia (DoA) monitors measurements can be affected by extreme positions 1,2 . Several surgical procedures, such as Robot-Assisted Radical Prostatectomy (RARP), require steep Trendelenburg position, thus DoA monitoring accuracy might be worsening over time 3. We aimed to compare BIS Vista ™ monitoring to EEG parameters over time in steep Trendelenburg.

Materials and Methods: We included 18 patients undergoing RARP and monitored them with BIS Vista [™] for 30 minutes after steep Trendelenburg positioning. We downloaded DoA monitorization data, and compared baseline BIS Index values to BIS Index values after 30 minutes in steep Trendelenburg. We consider baseline the moment just prior to steep Trendelenburg positioning

Results and Discussion: Contrary to what was reported by other authors, BIS Index remained stable in our study. We did not observe changes in BIS Index comparing baseline measurements to BIS Index values after 30 minutes in steep Trendelenburg positioning (Table 1). The main difference between the previous studies and ours is the monitoring time^{1,2}.

In other studies, authors monitored the first 15 minutes after anaesthetic induction (drug administration and haemodynamic

In our study, baseline register was made just prior to Trendelenburg positioning, which means that it's more than 15 minutes far from anaesthetic induction.

Parameter (Units)		Time since steep Trendelenburg positioning		
	rarameter	(Onits)	Basal (n=18) 30min (n=1	
	Left Hemis	phere, mean (SD)	44.5 (9.9)	43.1 (5.7)
BIS	Right Hemis	phere, mean (SD)	46.6 (13.3)	42.7 (4.9)
Index	p value	Left Hemisphere	Ref.	0.56
(compared to basal)	Right Hemisphere	Ref.	0.232	

Conclusion(s): BIS Index remains stable after 30 minutes in steep Trendelenburg when comparing to baseline measurements. Depth of Anaesthesia monitoring using BIS Vista ™ monitor seems to be an accurate parameter after 30 minutes in steep Trendelenburg position. Further investigations are required in this subject.

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31AP01-9

Impact of early moderate anemia on neurological outcome in neurocritically ill patients with mechanical ventilation

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Background and Goal of Study: Anemia is a frequent condition among neurocritical care patients and has been consistently associated with adverse clinical outcomes. Very low hemoglobin (Hb) levels can negatively affect neurological recovery and increase mortality, but the role of early anemia, as well as moderate anemia (Hb level <10 g/dL) in mechanically ventilated patients is not well studied.

In TBI patients, anemia has been independently linked to longterm unfavorable neurological outcomes and higher mortality. Evidence indicates that lower Hb levels at admission correlate with worse functional prognoses [1].

Similarly, in patients with ICH, anemia upon ICU admission is associated with limited functional recovery [2].

For SAH patients, anemia during ICU stays has been shown to increase neurological complications and lead to worse long-term outcomes [3].

The objective of the study is to define the role of early moderate anemia in unfavorable outcome in this subgroup of patients. We aimed to explore this association by evaluating the association between anemia and these outcomes in neurocritical ICU patients.

Our primary one was the Glasgow Outcome Scale Extended (GOSE) at six months post-admission. Secondary outcomes included mortality and length of hospital and ICU stay.

Materials and Methods: Retrospective analysis of a total of 158 neurocritical patients admitted to the Surgical ICU at Hospital Clinic of Barcelona between 2018 and 2023, who required invasive mechanical ventilation by the third day of admission.

A descriptive analysis was performed on the study variables: age, sex, comorbidities such as hypertension (HTN), diabetes mellitus (DM), dyslipidemia (DLP), chronic obstructive pulmonary disease (COPD), chronic kidney and liver disease; diagnosis; needing of surgery; laboratory data at 72 hours: hemoglobin, maximum dose of norepinephrine, C reactive protein, creatinine, leukocytes, platelets, temperature, minimum partial pressure of arterial oxygen, maximum partial pressure of arterial carbon dioxide; ICU and hospital length of stay; ICU and hospital mortality; and Glasgow Outcome Scale Extended (GOSE) at six months post-admission. Chi-square tests were used to evaluate associations between categorical variables, while Student's t-tests were applied for comparisons of continuous variables. Statistical significance was defined as p < 0.05.

Results and Discussion: A total of 158 patients were included in the study (mean age 54±17 years, 37% female). The patients were divided into two groups based on their Hb levels on the third day of admission. The moderate anemia group included those with Hb ≤10 g/dL, totaling 75 patients (48% of the sample), of whom 47% were women (p 0.02). It was observed an incidence of 48% HTN, 19% DM, 25% DLP, 9% COPD, 8% chronic kidney disease, 9% chronic renal disease. The diagnosis were 51% TBI, 24% SAH, and 25% ICH (p 0.016), needing 65% of them surgical procedures (p <0.001). The non-moderate anemia group, Hb >10 g/dL, included 83 patients (52% of the sample), 29% of whom were women. In terms of comorbidities, they presented 54% HTN, 10% DM, 22% DLP, 12% COPD, 6% chronic kidney disease, 6% chronic renal disease. In this case the diagnosis were 20% TBI, 40% SAH, 31% ICH; 31% of whom required surgical intervention. Moderate anemia was associated with longer hospital stay 37±32 days, versus 26±21 days in the non-moderate anemia group (p <0.001). The ICU length of stay was also longer in the moderate anemia group, 15±15 days compared to 12±8 days (p 0.097) (Image 1.A).

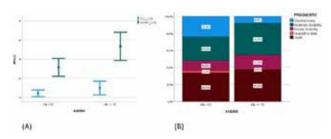


Image 1. (A) Difference in length of stay at hospital (p<0.001) and ICU (p 0.097). (B) Percentage of mortality and disability rate according to GOSE (p 0.04).

There were no differences in ICU (19%/21%, p 0.806) or hospital mortality (21%/25%, p 0.556). Six months after admission, these patients with moderate anemia showed a higher mortality rate (37%/34%) and a greater percentage of moderate (55%/45%) to severe disability (57%/44%) according to the Glasgow Outcome Scale Extended (GOSE). Additionally, the percentage of patients with complete recovery was significantly lower in the moderate anemia group (23%) compared to the non-moderate anemia group (77%) (p 0.04) (Image 1.B).

Conclusion(s): Early moderate anemia is associated with worse long-term outcomes, such as higher mortality and severe disabilities in neurocritical patients under mechanical ventilation. These findings suggest the importance of monitoring and properly managing anemia in these patients to improve functional outcomes and reduce long-term complications. However, further studies are needed to better define hemoglobin thresholds and the most effective transfusion strategies in this context.

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31AP01-10

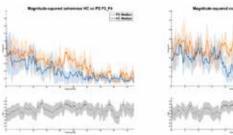
EEG-based neuromonitoring in anaesthesia and preoperative identification of Parkinson's disease: limitations and potential pathways

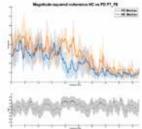
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Introduction: Patients with Parkinson's disease (PD) face increased perioperative risks. Up to 96% remain undiagnosed before age 50, making early identification crucial for optimizing anaesthesia and recovery care. [1] Preoperative electroencephalography (EEG) may be a biomarker, even when using the reduced frontal montage for anaesthesia neuromonitoring. However, processed indices used to assess anesthetic depth may obscure EEG signatures of PD.

Methods: Resting-state, eyes-open EEG data from an Open-Neuro dataset [2] were analyzed, including 15 PD patients and 16 healthy controls (HC). We focused on frontal electrodes (F3,F4, F7, F8). Absolute and relative power spectral densities (PSDs) were generated for $\delta,\,\theta,\,\alpha,\,\beta,\,\gamma$ bands. Processed parameters included spectral edge frequency (SEF), spectral entropy (SpEn), permutation entropy (PeEn), and the openibis index. [3] Magnitude-squared coherence (MSC) between frontal electrodes was also analyzed. All analyses were performed on individual channels and averaged for interhemispheric pairs. We used the Mann-Whitney-U-Test. Discriminatory ability was evaluated via AUROC. Results: Frontal PSD differences were modest. PD patients showed significantly higher relative [] power at F7 F8 (p=0.018), AUC: 0.63 [0.43-0.83]). No significant group differences in processed indices (SEF, SpEn, PeEn, openibis) were found: SEF (F3 F4 p 0.937, F7 F8 p=0.227), SpEn (F3 F4 p=0.464, F7 F8 p=0.858), PeEn (F3_F4 p=0.417, F7_F8 p=0.395), openibis (F3_F4 p=0.566, F7_F8 p=0.277). MSC analysis showed significantly increased coherence in the high [] range (20-29.9 Hz) for PD at F3_F4 (p=0.017, AUC: 0.75 [0.57-0.92] see Figure 1) and F7_F8 (p=0.034 AUC: 0.73 [0.53-0.90] see Figure 1).

Conclusions: Differentiating PD from HC using a reduced frontal montage is challenging. Conventional anesthesia monitoring parameters fail to detect pathological PD EEG signatures. MSC analysis could offer a promising future approach.





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31AP01-11

Cardiac tamponade, an unusual complication in subarachnoid hemorrhage

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Background: Traditionally, subarachnoid hemorrhage (SAH) causes a catecholamine storm, that leads to acute left ventricular systolic dysfunction. Cardiac tamponade is an infrequent complication in SAH.

Case Report: A 70 year-old woman, with a history of inflammatory ileitis, presented to emergency department, after severe headache and loss of consciousness. The initial Glasgow Coma Scale was 11. Computed tomography angiography (angioCT) revealed Fisher III SAH, due to 8 mm aneurysm in the left middle cerebral artery bifurcation. Successful embolisation was performed in the next hours.

Despite intended arterial hypertension and oral nimodipine for neuroprotection, on day 7 from diagnosis, the patient presented aphasia. Vasospasm was verified thanks to CT and 2 mg of focal intraarterial nimodipine were infused in both middle cerebral arteries (MCA). Vasospasm was diagnosed daily and treated angiographically.

On day+12 after SAH, hemodynamic instability begun, and increasing doses of norepinephrine were needed. Though maintaining mean blood pressure >80 mmHg, neurological clinical signs returned as mutism, and intraarterial nimodipine was again proceeded. At the end of nimodipine infusion, the need of high doses of catecholamine increased. There weren't changes in electrocardiogram. An echocardiography was performed, and revealed a cardiac tamponade. A pericardiocentesis relieved a 500 ml pericardic effusion with transudate characteristics. Despite of tamponade treatment, cardiogenic shock maintained. Moreover, cerebral angioCT concluded bilateral ischemic regions in both MCA areas. Unfortunately, patient died at day 26 after SAH.

Discussion: In a patient with previous systemic inflammation disease, SAH could act as a trigger of rare extracerebral complications (cardiac tamponade). Furthermore, this case reinforces the central role of the inflammation in the development of post-SAH complications, such as vasospasm.

Reference:

Miller BA, Turan N, Chau M, Pradilla G. Inflammation, vasospasm, and brain injury after subarachnoid hemorrhage. Biomed Res Int. 2014:2014:384342

Learning Points: Inflammatory response caused by SAH aggravates basal proinflammatory diseases, and in turn, those previous states worsen post-SAH neurological injuries.

In case of hemodynamic instability after SAH, echocardiography is a simple and non invasive diagnostic tool, in order to diagnose neurogenic cardiomyopathy or other causes, as cardiac tamponade.

31AP01-12

Assessing consciousness in acute central nervous system disorders: a study of four neurobehavioral scales

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Background and Goal of Study: Recovery following central nervous system (CNS) injuries typically involves distinct stages. marked by varying levels of consciousness. However, no universally accepted "gold standard" exists for quantitatively assessing disorders of consciousness, and a variety of neurological examinations and neurobehavioral scales are commonly employed in clinical practice.

This study aimed to evaluate the diagnostic sensitivity of four neurobehavioral scales in patients with CNS pathologies that included traumatic brain injury, hemorrhagic stroke, or ischemic stroke

Materials and Methods: The study analyzed 30 patients with CNS pathologies admitted to the Intensive Care Unit (ICU) at the Department of Anesthesiology and Intensive Care and the Department of Neurology, Clinical Hospital Center Rijeka. Data were collected over six months, excluding patients younger than 18 or older than 82 years. Each patient was assessed using four neurobehavioral scales - Glasgow Coma Scale (GCS), Full Outline of UnResponsiveness (FOUR), Glasgow Outcome Scale (GOS), and Coma Recovery Scale-Revised (CRS-R) – at three time points: upon admission, two days after discontinuation of analgosedation (first assessment), and 12 days post-analgosedation (second assessment). Statistical analysis was performed to assess the sensitivity of each scale over those three time points.

Results and Discussion: Statistical significance was observed in GCS scores between admission and the first assessment, specifically in the overall score, verbal response, and motor response. Similarly, FOUR scores showed significant differences between admission and both the first and second assessments, with notable changes in overall scores, motor response, brainstem reflexes, and breathing patterns. GOS and CRS-R scores did not demonstrate statistical significance.

The FOUR scale is considered superior to the GCS due to its ability to assess brainstem function as well as respiration. It also excludes verbal response, making it well-suited for use in intubated or tracheotomized patients. The scale demonstrates good reliability and is specifically designed for acute conditions.

Conclusion(s): In the acute phase following CNS injuries, the FOUR scale demonstrated superior sensitivity in detecting subtle changes in consciousness compared to GCS, GOS, and CRS-R. This highlights its potential as a valuable tool in the ICU for assessing consciousness levels in patients with CNS pathologies.

31AP02-1

Effects of remimazolam on the circadian rhythm mechanisms in mice

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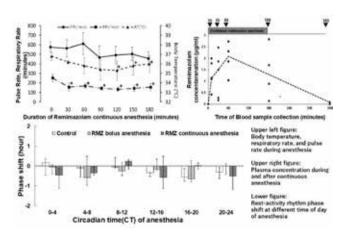
Background and Goal of Study: Central circadian clock in mammals is in suprachiasmatic nucleus (SCN), where Clock genes generate rhythm. Some anesthetics affect circadian rhythms, but the effects of remimazolam (RMZ) are unexplored. We examined the effects of RMZ on circadian rhythms of mice through a multidisciplinary approach.

Materials and Methods: Sudy was approved by the Animal Experimentation Ethics Committee. We used C57BL/6J mice.

Experiment 1: Anesthesia was performed by a single intraperitoneal (IP) injection of RMZ at 2 mg or by a IP injection followed by continuous infusion at 3 mg/h for 3 hours. Time to loss and recovery of the righting reflex, as well as body temperature(BT), respiratory rate(RR), and pulse rate(PR), were measured (n=52). Drug plasma concentrations were measured over time in separate animals (n=25).

Experiment 2: Rest-activity rhythm phase shifts and their variation by time of day of anesthesia(n=116) were examined, as well as clock genes expression using quantitative PCR (n=48).

Experiment 3: Cultured SCN from transgenic mice were exposed to RMZ, and clock gene expression rhythms were analyzed by luminometer (n=40). Kruskal-Wallis test, Mann-Whitney U test, and others were used for analysis (significance level P<0.05).



Results and Discussion: Time to loss of the righting reflex was 0.75 minutes (Median), and recovery was 11.9 minutes for single injection and 202 minutes for continuous infusion. BT dropped to 35.3°C, RR to 62%, and PR to 81% (upper left figure). Plasma concentration peaked at 2.08 µg/ml 1 hr after infusion began (upper right figure). Phase shift showed no difference between control group (-0.21 hr), single injection group (-0.04 hr), and continuous infusion group (-0.17 hr), with no fluctuation depending on the time of day of anesthesia (lower figure).

Expression of clock genes Period2, Bmal, Cryptochrome1, and Npas2 decreased to 76-90%. There was no marked change in bioluminescent circadian period of the SCN under exposure to RMZ at any concentrations.

Conclusion: RMZ suppressed the expression of clock genes, but there was no phase shift in behavioral rhythm. RMZ did not alter clock gene expression rhythm in SCN.

31AP02-2

The Association of Preoperative Glycemic Control as HbA1c Levels with Intraoperative **Burst Suppressions as a Potential Risk of Postoperative Delirium**

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Background and Goal of Study: Hyperglycemia's relationship with neurological abnormalities is not unexpected. Intraoperative monitoring with electroencephalography (EEG) enables observations such as burst suppressions related to possible central neuropathy and delirium.

So, this study searches for any relation between preoperative glycemic control as the cause of susceptibility to burst suppressions on EEG and postoperative delirium as a clinical consequence.

Materials and Methods: This retrospective analysis included 70 patients undergoing major arthroplasty under general anaesthesia and EEG monitoring within the last four months.

As part of the safe brain initiative, suppression time and rate (SR, ST) of processed EEG and postoperative delirium were recorded along with preoperative glucose and HbA1c levels of the diabetic patients.

Results and Discussion: There were no significant differences in burst suppressions or delirium in patients with diabetes, including insulin-dependent and non-dependent (Table 1).

There is no association between HbA1c levels; however, preoperative glucose levels were related to ST durations (Table 2).

		Diabetes (+) (n:42)	Diabetes (+) (n:28)	1.1	
		Mean:sd/n-% Median	Mean sd/n-% Median	Р	
Age		63.7 ± 9.6 66.5	66.4 ± 8.4 68.0	0.225 =	
Character	Female	25 59.5%	21 75,0%	0.181 X	
Gender	Male	17 40.5%	7 25.0%	0.181	
ASA Score 1	1	10 26.2%	0 0.0%	0.003 X	
	П	25 59.5%	23 82,1%	0.003	
	111	6 14.3%	5 17.9%		
Comorbidity	(-)	15 35.7%	3 10.7%	0.019 X	
Comorbidity	(+)	27 64.3%	25 89.3%	0.019	
PACU	(-)	40 95.2%	23 82.1%	0.074 N	
Delirium	(÷)	2 4.8%	5 17.9%	0.074	
Commenter	(-)	24 57.1%	10 35,7%	0.079 N	
Supression	(+)	18 42.9%	18 64.3%	0.0079	
ST (sn)		45.8 ± 82.6 20.0	74.4 ± 104.1 24.0	0.154 "	
SR Max		6.8 ± 3.6 6.0	10.8 ± 6.9 9.5	0.136 =	

[&]quot;Mann-whitney u test / N Chi-square test (Fischer test)

Table 1.

		Preop Glucose	HbA1c
ST (sn)	r	0.526	0.110
	p	0.030	0.674
CD M	r	0.329	0.243
SR Max	p	0.197	0.347

Spearman Correlation

Table 2.

Regarding these preliminary findings, diabetes with high HbA1c levels could not significantly change susceptibility to burst suppressions and delirium. Despite the suggestion that preoperative diabetes is associated with postoperative delirium in older patients, the results could depend on prolonged exposure to high glucose levels rather than diabetes itself.

Conclusion(s): Our findings suggest that it is not diabetes, with high HbA1c levels, but rather preoperative hyperglycemia that could result in susceptibility to burst suppressions. This finding opens up avenues for future research, particularly in stress-induced hyperglycemia and its potential association with intraoperative burst suppression and postoperative delirium.

31AP02-3

Correction of post-induction hypotension during planned craniotomy for brain tumors

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Background and Goal of Study: Arterial hypotension during anesthesia occurs in 5-99% of cases. About 1/3 cases of hypotension are post-induction arterial hypotension (PIH) - decrease in blood pressure in the period from induction of anesthesia to surgical incision. PIH is a common side effect of the general anesthesia, caused by a decrease of systemic vascular resistance[1]. Arterial hypotension during anesthesia associated with an increased risk of myocardial injury [2].

Perioperative myocardial injury after noncardiac surgery (PMI) is an asymptomatic complication of noncardiac interventions associated with increased postoperative mortality [3].

This nosology is poorly studied for patients with brain tumors. The use of vasopressors is an etiotropic method of correcting PIH. Arterial hypertension is a possible side effect of vasopressors, potentially dangerous in neurosurgery due to the risk of intracranial hemorrhage.

The goal of the study was to evaluate the effectiveness and safety of goal-directed prevention and correction of PIH for enhanced cardiac risk patients in elective surgery of brain tumors.

Materials and Methods: The analysis included 123 patients (aged 65 years and older or over 45 years old when assessed by RCRI ≥1) operated for brain tumors at Burdenko National Medical Research Center of Neurosurgery. Total intravenous anaesthesia (propofol + fentanil) was used in all cases.

Blood pressure was measured by a noninvasive interval method. PIH was defined as decrease in mean blood pressure <65 mmHg. In 92 patients, hemodynamic management in the perioperative period was carried out at the discretion of the anesthesiologist ("traditional approach" - group 1). Goal-directed prevention and correction of PAH was performed in 31 patients: withdrawal of antihypertensive drugs on the day of surgery (except beta-blockers), when systolic BP decrease <90 mmHg - infusion of crystalloids 5 ml/ kg, when mean BP a decrease <65 mmHg - simultaneous infusion of crystalloids 5 ml/ kg and norepinephrine at the starting dosage 0.03 µg/kg/min (group 2).

For PMI detection, patients underwent analysis of hs-sTpl concentration in blood serum and ECG recording before surgery, on the 1st and 2nd days after surgery.

PMI was defined as: elevated postoperative hs-cTnI concentration in blood serum with ≥1 hs-cTnl measurement above the 99th percentile of the URL (for initial normal hs-cTnl) or a change of hs-cTnl on 1 and/or 2 days after surgery by 20% or more (for initial abnormal hs-cTnI) without any ischemic changes in perioperative ECG. Perioperative hemodynamics, hs-cTnl concenstration in blood serum, and the incidence of PMI were compared between the groups.

Results and Discussion: The incidence of PIH was not differ significantly between the groups and was 45-52%. The dosages of propofol and fentanyl for induction and maintenance of anesthesia did not differ significantly between the groups.

The duration of PIH was significantly lower in group 2: ME 9 min (IQR 6-15) vs. ME 20 min (IQR 10-30), p=0.001. The frequency of norepinephrine use was significantly higher in group 2 (42% [n=13] vs. 11% [n=10].

None of the patients in group 2 had arterial hypertension (SBP >140 mmHg) in the post-induction period, in group 1 arterial hypertension was recorded in 2% (n=2) patients. PMI developed more often in patients of group 1: 17% (n=16) versus 6% (n=2).

Conclusion(s): The use of protocol for goal-directed correction of PIH does not reduce the risk of PIH development, but allows reducing PIH duration safely for the patient.

The use of protocol for goal-directed correction of PIH reduce the frequency of PMI for enhanced cardiac risk patients in elective surgery of brain tumors.

References:

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31AP02-4

Pilot study to investigate the interrater agreement of intraoperative burst suppression identification

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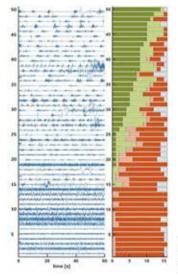
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Background and Goal of Study: Intraoperative neuromonitoring is crucial for evaluating anesthesia levels, as EEG patterns like Burst Suppression (BSupp) are linked to postoperative neurocognitive disorders, e.g. delirium. However, many commercial monitoring systems underestimate BSupp occurrence due to limitations in their algorithms.

Further, a standardized definition of BSupp is missing. Existing definitions from neurological expert societies cannot be directly applied to anesthetic-induced BSupp, as significant differences exist in underlying pathophysiological mechanisms. Additionally, factors such as patient age and anesthetic agents influence clinical characteristics and EEG frequency parameters.

Materials and Methods: To establish a consensus definition for anesthetic-induced BSupp, expert agreement is essential. This project aims to facilitate such consensus among anesthesiology experts. 50 representative 60 s EEG episodes containing definitive BSupp patterns (positive controls), intraoperative EEG without BSupp (negative controls), or patterns suggesting potential BSupp-like activity were used for expert assessment. A MATLAB tool was developed to enable 18 international experts to evaluate the dataset pseudonymously, revealing significant variability in the visual recognition of BSupp and highlighting the need for standardized classification standards.

Results and Discussion: The following graph shows the agreement of the visual EEG evaluation. While the scorers agreed upon the negative controls, the assessment of the (potential) BSupp episodes led to heterogeneous results for most of these episodes. This result highlights the lack of standard for BSupp definition and the need for a consensus to improve the (automated) BSupp detection. Such a consensus would also help to improve the reliability of processed BSupp parameters like suppression duration, amplitude, or the burst suppression ratio.



Conclusion: With these preliminary results of our study, we can visualize the discrepancy in BSupp assessment and highlight the need for a common BSupp definition as different assessments could influence study results.

31AP02-5

Electroconvulsive therapy in super-refractory status epilepticus: a case report

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Background: Super-refractory status epilepticus (SRSE) is a lifethreatening condition that lasts for more than 24 hours despite anesthetic treatment or recurs once treatment is withdrawn. It is associated with high mortality and significant neurological damage, posing a major clinical challenge.

Case Report: A 23-year-old female with autoimmune encephalitis developed SRSE after presenting with anxiety, motor impairments, and myoclonic seizures. Despite treatment with methylprednisolone, plasmapheresis, and cyclophosphamide, her condition remained refractory. Electroconvulsive therapy (ECT) was used as an additional therapeutic approach.

Discussion: The patient underwent multiple ECT sessions under controlled anesthesia in an intensive care unit. Although some ictal suppression was observed, full remission of seizures was not achieved. Neuroimaging and serological tests confirmed autoimmune encephalitis, and the patient eventually progressed to a persistent vegetative state with ongoing seizures and poor neurological prognosis. This highlights the complexity of SRSE and the limited effectiveness of available treatments, including ECT.

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Learning points:

- SRSE is a critical and often refractory condition, particularly when associated with autoimmune encephalitis.
- ECT may offer short-term seizure suppression in SRSE but is not a guaranteed long-term solution.
- There is a need for further research to optimize treatment protocols for SRSE, especially in the context of autoimmunerelated cases.

31AP02-6

An unusual cerebral oximetry desaturation in carotid endarterectomy - the importance of clinical neurological monitoring: a case report

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Background: Protection of the brain from ischemic injury during carotid endarterectomy (CEA) is one of the main anesthetic goals. Regional anesthesia (RA) allows continuous neurologic assessment, widely considered the gold standard. Neuromonitoring with cerebral oximetry and processed electroencephalogram (pEEG) presents as alternatives.

Case Report: A 77 year-old woman, ASA IV, underwent a left CEA after a transient ischemic attack. Echo-doppler showed stenosis >70% in the left carotid artery (CA) and 50-70% in the right CA and CT angiography a right vertebral artery hypoplasia (VAH). Medical history included hypertension, heart failure NYHA 2 and long-term oxygen therapy after a recent hospitalization for viral pneumonia.

Surgery was performed under intermediate cervical plexus block, combined with dexmedetomidine infusion, and cerebral oxygen saturation (rSO2) and bilateral pEEG monitoring. After left CA clamping, a decrease of 20% in right rSO2 was observed, with dysarthria and decreased left motor response. Correct placement of electrodes was verified, head repositioned and blood pressure increased without changes. A carotid shunt was placed. with immediate increase of rSO2 and reversal of neurological deficits. At the end of the procedure, rSO2 was similar to baseline value, and the patient had no neurological deficits. Postoperative period was uneventful.

Discussion: An unusual contralateral rSO2 desaturation was observed after clamping (with simultaneous drop in right pEEG values), followed by neurological symptoms. An incomplete Circle of Willis has been associated with an increased risk of neurological events in patients undergoing CEA without shunting. However, despite a VAH, the patient's Circle of Willis was complete with no other documented intracranial stenosis interfering with collateral

Even though we cannot justify the drop in right rSO2, clinical signs and neuromonitoring changes agreed so the decision to perform a shunt was taken, with immediate increase in rSO2 levels and reversal of deficits.

Learning points: Under general anesthesia, detection of the neurological deficits associated with a simultaneous drop in right rSO2 would not be possible, risking a misinterpretation as an artifact. We emphasize the importance of a continuous neurologic assessment, highlighting the advantages provided by RA, particularly when continuous neurological monitoring is critical to ensure patient safety and outcomes.

31AP02-7

Reversible Posterior Encephalopathy Syndrome (PRES): A rare but reversible cause of seizures

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Background: Reversible Posterior Encephalopathy Syndrome (PRES) is a neurological condition characterized by clinical features such as headache, seizures, altered consciousness, and vision loss, along with radiological evidence of reversible structural changes in the parieto-temporo-occipital regions of the brain.

Case Report: A 55-year-old male with hypertension, type 2 diabetes, anxiety-depressive syndrome, and Crohn's disease was admitted to the ICU following multiple surgeries for perforations and obstructions related to Crohn's disease. He had a Bogotá bag for a wall defect and enterocutaneous fistula.

While he was hemodynamically stable, he experienced hypertensive spikes linked to agitation episodes and required mechanical ventilation via tracheostomy. During his ICU stay, the patient had

A brain CT scan was performed, which was normal. Neurology was consulted and decided against immediate intervention. Despite remaining conscious, the patient had difficulty controlling agitation and suffered two additional seizures.

A second CT scan revealed multiple hemorrhagic foci in the parieto-temporo-occipital regions, with the largest lesion measuring 2.5x3.1 cm, accompanied by adjacent brain edema.

This led to a diagnosis of PRES. The treatment plan included strict blood pressure control, seizure management with levetiracetam and lacosamide, and a brain MRI, which confirmed the diagnosis.

Discussion: The most widely accepted theory for the development of PRES suggests that a sudden increase in blood pressure exceeds the brain's autoregulatory capacity, leading to vasodilation, hyperperfusion, and endothelial damage with vasogenic edema. The clinical presentation is primarily neurological, ranging from confusion to stupor and seizures. Focal neurological deficits are rare. Initial assessment typically involves a brain CT, which may appear normal or show hypodensities in the temporal or posterior cortical-subcortical areas. A brain MRI is needed for a definitive diagnosis. With appropriate treatment, PRES is reversible, although neurological sequelae or even death if not managed in time can occur.

Learning points: In cases of unexplained neurological symptoms, it is crucial to perform imaging tests, keeping in mind that early stages of PRES may not show abnormal findings. Treatment consists of strict blood pressure control and active neurological monitoring. Early diagnosis is vital to initiate treatment during the reversible phase of PRES.

31AP02-8

Aneurysmal subarachnoid haemorrhage and ischemic stroke: case report

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Background: Subarachnoid haemorrhage (SAH) is a neurovascular emergency. The spontaneous rupture of an intracranial aneurysm represents the majority of the cases. Cerebral vasospasm after SAH can lead to delayed cerebral ischemia increasing associated morbidity and mortality.

Case report: Male, 43-year-old, with no medical history, begins with vomits and headaches. Three days later as symptoms get worse, he comes to the emergency room. On physical examination, Glasgow coma scale (GCS) 10. Blood tests showed hyponatremia 122mg/dL.

Head computerized tomography (CT) with angiography showed SAH and a saccular aneurysm of the anterior communicating artery (ACA). Admitted to the intensive care unit and began nimodipine 60mg every 4 hours.

The day after admission he did Transcranial Doppler (TCD) with evidence of severe vasospasm in the right middle cerebral artery (MCA) and moderate in the left MCA, therefore, underwent digital subtraction angiography (DSA) with intraarterial verapamil injection and apparent resolution.

On the second day of hospitalization, he had neurosurgical intervention with aneurysm clipping. Over the next week, severe vasospasm was identified on daily TCD, so he did almost daily DSA. On the seventh day, he starts with left hemiparesis, head CT scan showed recent ischemic lesions in bilateral frontal, right temporal and parietal regions and underwent DSA.

On the ninth day, GCS of seven, he is intubated and ventilated. Intracranial pressure (ICP) monitoring is placed, initially ICP 64mmHg, lowering to 12-14mmHg with elevation of head of the bed and hyperosmolar agents.

DSA showed subocclusive thrombus of the right MCA, mechanical thrombectomy was performed, maintaining partial occlusion. During hospitalization, there was no evidence of atrial fibrillation as an embolic cause. The following day he developed refractory intracranial hypertension. Head CT scan shows a right malignant ischemic stroke, decompressive craniotomy is performed. Despite all the measures, there was clinical worsening with brain death.

Discussion: SAH remains a challenging and complex condition. This case represents a SAH complicated with an ischemic stroke. evidence of thrombus in the location of the severe vasospasm and distal to the site of the ACA aneurvsm.

Learning points: The pathophysiological mechanisms of aneurysmatic SAH are complex and not fully understood. Cerebral vasospasm is a common complication, which can lead to neurological deterioration.

31AP02-9

Early Quantitative Pupillometry Index (QPi) as a predictor of long term outcome in severe traumatic brain injury patients: a prospective observational study

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Background & Goal of Study: Pupillary examination is integral to neurological examination & aids in decision-making and prognostication. Severe traumatic brain injury (sTBI) leads to raised intracranial pressure, which is the main factor altering pupillary reactivity.

In contrast to routine subjective pupillary examination, Automated pupillometry provides objective, quantitative and reproducible data of pupillary characteristics. Quantitative Pupillometry index (QPi) is a composite index of pupillary reactivity, with a score ranging from 0-5, provided by Automated pupillometer. We aimed to evaluate the association of early QPi and long term outcome (GOSE at 6 months) in adult sTBI patients.

Materials and Methods: This single centre, prospective, observational study was conducted after CTRI registration (CTRI/2023/03/050584) in 100 adult sTBI patients(GCS</=8) admitted to Neurocritical care unit within 48 hours of injury. After obtaining a valid consent, baseline demographic data of GCS on admission, mode of injury, hypoxia, hypotension, Marshall and Rotterdam CT score was obtained.

Automated pupillometry was performed at 0, 12, 24, 48, 72 hours and QPi was noted(0-5). Patients were followed up telephonically at 6 months to assess neurological outcome with extended Glassgow Outcome Scale (GOSE). We used logistic regression to assess the association between QPi and neurological outcome and mortality at 6 months.

Results & Discussion: Between December 2023 to September 2024, 100 sTBI patients were enrolled. The median age was 35 years, predominantly male, 89 (89%) patients, and RTA being the most common mode of injury- 84 (84%) patients. Median GCS at admission was 7 (4-8). Total of 980 QPi readings were obtained, 445 (45%) of which were abnormal (QPi<3).

Mean ICU and hospital stay was 9.8 (6.32) and 17.99 (14.50) days respectively. 6 months GOSE was assessed in 92 patients telephonically. 63 (68%) patients had a poor neurological outcome (GOSE</=4), of whom 35 (38%) died. The association of QPi with neurological outcome was adjusted for the effects of Age, GCS at admission, Marshall and Rotterdam CT scores. A single unit decrease in median QPi was associated with a poor neurological outcome (adjusted odds 1.80 [95% CI 1.04-3.11] p-value=0.03) and mortality (adjusted odds 4.15 [95% CI 1.50-11.49] p-value=0.006).

Conclusion: Automated Pupillometry derived QPI has statistical association with neurological prognosis and mortality in sTBI pa-

31AP02-10

Incidence, risk factors and outcomes in relation to seizures and epileptiform activity in neurocritically ill patients: a retrospective cohort study

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Background and Goal of Study: Epileptic seizures are commonly associated to acute brain injury (ABI), occurring in around 10% of these patients, and are related with poorer clinical outcomes. Accurate diagnosis of seizures in this context can be challenging, especially in patients undergoing sedation and mechanical ventilation.

Prophylactic use of antiepileptic drugs (AEDs) in this population is a common practice during the first days in ICU care. However, its role in improving clinical outcomes after an ABI remains un-

We aimed to describe the incidence of clinical and electrical seizures in our cohort of patients suffering from ABI, including subarachnoid haemorrhage (SAH), intracranial haemorrhage (ICH) and traumatic brain injury (TBI).

Our secondary objectives were to analyse the risk factors, longterm functional status and incidence of secondary epilepsy related to the occurrence of in-hospital seizures in this population.

Materials and Methods: A retrospective, single-center cohort analysis with ABI patients admitted in the Surgical ICU of a tertiary hospital between 01/01/2018 and 30/06/2023 was performed.

Patients aged ≥18 years with a diagnosis of SAH, ICH or TBI and a minimum of 72 hours of mechanical ventilation were included. Patients were stratified in two groups, based on whether they presented in-hospital seizures or not.

The incidence of secondary epilepsy and functional status with Extended Glasgow Outcome Scale (GOS-E) was compared between groups. Univariate and multivariate analysis were performed in order to explore variables possibly associated with seizure occurrence.

Results and Discussion: 159 patients were included. Seizures occurred in 25.2% of cases during in-hospital stay. Age >50 years (OR 3,35) and lack of prophylactic AEDs (OR 30,47) were independently associated with seizure occurrence in multivariate

None of the patients in the non-seizure group presented secondary epilepsy, whilst 19,4% of patients in the seizure group did. Patients in the non-seizure group presented overall better GOS-E scores, but the difference between groups was not statistically significant.

Conclusion(s): The incidence of in-hospital seizures in our cohort of patients with ABI was higher than previously reported in literature. Lack of prophylactic AEDs was the main factor associated with the occurrence of seizures. Further research is needed in order to determine the impact of AEDs and in-hospital seizures in long-term outcomes.

31AP02-11 Superficial spinal siderosis: is it worth taking

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Background: Superficial Siderosis (SS) of the CNS is a rare disease. It originates from the deposition of hemosiderin in the subpial spaces of CNS and cranial nerves following chronic hemorrhages, usually clinically silent, in the subarachnoid space. It is also associated with dural ectasia due to defects or weaknesses in the dura mater, with CSF leakage. We present the clinical case of a woman with spinal involvement from SS, scheduled for surgical correction of a femur fracture.

Case Report: A 78-year-old woman, ASA III, followed in neurology due to spinal involvement from SS, was scheduled for surgical correction of a supracondylar femur fracture. Given the uncertainty about the optimal anesthetic approach and the potential risks of complications with a neuraxial approach, a decision was made to perform general anesthesia. After standard ASA monitoring, BIS and TOF, intravenous anesthetic induction was performed, followed by neuromuscular blockade and endotracheal intubation without complications. Maintenance was achieved with sevoflurane. The patient remained hemodynamically stable, with appropriate BIS values without suppression. During extubation, after reversal of neuromuscular blockade with sugammadex, monitored with TOF and adequate BIS, there was a prolongation in the ventilatory weaning process, with a delay in achieving autonomous and spontaneous ventilation. After progressive weaning, extubation was performed without complications or the need for ventilatory support in the PACU. The patient was discharged without postoperative complications

Discussion: Preferential involvement of SS at the spinal level was observed, associated with extensive dural ectasia. A neuraxial approach was avoided to prevent hemorrhagic complications and worsening of CSF leakage. General anesthesia proved to be effective, without complications. The difficulty in ventilatory weaning raised the hypothesis of respiratory muscle involvement. More documented clinical cases will be necessary to consolidate the anesthetic management.

Reference:

Weidauer, S., Neuhaus, E., & Hattingen, E. (2023). Cerebral Superficial Siderosis. Clinical neuroradiology Kumar, N. (2007). Superficial Siderosis. Archives of Neurology, 64

Learning points: In SS, neuraxial anaesthesia carries significant risks due to the potential for exacerbating CSF leaks or hematomas. General anaesthesia proved effective, as a safer approach. Further research is required to establish evidence-based guide-

31AP02-12

Conscious sedation and general anesthesia management in deep brain stimulation surgery for Parkinson's disease

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Background: Deep brain stimulation (DBS) has become an effective treatment for Parkinson's disease (PD), with patient cooperation and consciousness during the procedure significantly enhancing its success (1). This case report presents our anesthetic management during DBS surgery for PD.

Case Report: A 50-year-old male patient, ASA II due to PD, was informed about the procedure and provided written consent. After routine ASA monitoring, 1 mcg/kg dexmedetomidine was administered intravenously for conscious sedation. A local anesthetic (LA) solution consisting of 36 mL of 0.5% bupivacaine and 4 mL of 0.05 mg/mL adrenaline was prepared for the scalp block. After sterilization, 5 mL of LA was administered to the greater occipital nerve, 3 mL to the lesser occipital nerve, 2.5 mL to the zygomaticotemporal nerve, 2.5 mL to the supraorbital nerve, and 2.5 mL to the auriculotemporal nerve bilaterally.

Fifteen minutes after the block, a stereotactic frame was placed. The patient was transported to CT for nucleus targeting. Anterior-posterior commissures coordinates were determined, and indirect coordinates were calculated using brain atlases. A burr hole was created, and bilateral electrodes were placed under neurological evaluation, with the patient maintaining a Ramsey sedation scale score of 3. Radiological confirmation was obtained with repeat CT.

The patient returned to the operating room for completing the electrode power source connections. General anesthesia was induced with 4 mg/kg thiopental and 0.6 mg/kg rocuronium, followed by intubation. The power source was implanted beneath the clavicle. Arterial blood pressure was maintained below 120/80 mmHg with nicardipine infusion. After 74 minutes of anesthesia, the patient was awakened with sugammadex and transferred to the ICU.

Discussion: DBS treatment for PD requires accurate mapping, patient cooperation, and pain-free procedures for success (2). Scalp block combined with awake craniotomy offers significant advantages, such as enabling intraoperative neurological assessment and reducing postoperative pain. This approach is optimal for such patients.

References:

- 1. Malek N. Deep Brain Stimulation in Parkinson's Disease. Neurol India. 2019 Jul-Aug;67(4):968-978.
- 2. Venkatraghavan L, Luciano M, Manninen P. Anesthetic management of patients undergoing deep brain stimulator insertion. Anesth Analg. 2010 Apr 1;110(4):1138-45.

31AP03-1

Dexmedetomidine-mediated modulation of brain oxygenation and neuromarkers' release during brain tumor surgery

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Background and Goal of Study: Accumulating evidence supports that dexmedetomidine (DEX) exerts organ protective properties in several injury models including ischemia-reperfusion, inflammation, and traumatic brain injury. We aimed to investigate the impact of DEX on brain oxygenation and neuromarkers' release in patients subjected to craniotomy for tumor excision.

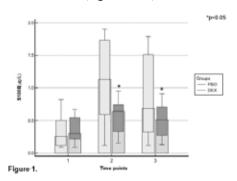
Materials and Methods: Prospective, double-blind randomized controlled trial enrolling 54 adult patients scheduled for elective craniotomy for tumor excision. A standard anesthesia protocol based on total intravenous anesthesia was applied to all cases. Patients were allocated into two groups:

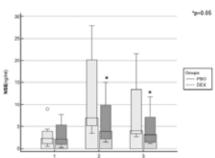
- 1. Group DEX received DEX 1µg/kg for 10 min (bolus) and thereafter 0.7µg/kg/h (civ) and;
- 2. Group PBO received N/S 0.9% at the same infusion dose.

Following jugular bulb catheterization blood samples were received at predefined time points: 5 min before intervention, 15, 30, 60, 120, 180, and 240 min after DEX infusion for jugular bulb oxygenation (SjO₂) registration. Blood samples were also obtained at baseline (1), 6, and 24 hours (2 & 3) after surgery completion for S-100B and NSE determination.

Results and Discussion: No differences were recorded regarding patients' demographic and intraoperative data. A relatively lower heart rate and a notably higher mean arterial pressure were registered following DEX infusion (p<0.05).

Moreover, DEX augmented SjO_2 at 10 and 30 min post-infusion (p<0.05) and attenuated the release of S-100B and NSE at 6 and 24 hours. Notably, the postoperative augmentation of both neuromarkers was rather trivial (Figures 1 & 2).





Conclusion(s): It seems that dexmedetomidine serves as an attractive anesthetic adjuvant during brain tumor surgery, on the basis that it can improve intraoperative brain oxygenation and attenuate perioperative brain injury.

31AP03-2

The use of density spectral array in anesthetic management of intraoperative epileptic activity in emergency neurosurgery: a case report

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Background: Seizures affect 10% of the population and can result from brain injuries such as hemorrhagic strokes. Processed electroencephalography (pEEG) is widely used in the operating room (OR) to monitor anesthesia depth. The Bispectral Index (BIS) is a commonly used tool, recently complemented with density spectral array (DSA).

We report a case of intraoperative epileptic activity suggested by DSA during general anesthesia (GA).

Case Report: A 75-year-old woman with spontaneous intraparenchymal hematoma and intraventricular rupture presented with focal tonic-clonic seizures of the right hemibody, bradycardia and hypertension, treated with levetiracetam and proposed for external ventricular drainage (EVD) placement.

In the OR, repetitive right upper limb movements raised suspicion of seizure activity. After rapid-sequence induction with fentanyl, propofol, and rocuronium, GA was maintained with propofol.

Minutes later, DSA revealed bilaterally increased power evolving from low to high frequencies, consistent with epileptic activity unresponsive to propofol adjustments.

A midazolam bolus induced burst suppression and reduced discharges to <4 Hz. After EVD placement, the patient was transferred to the ICU. Postoperative EEG showed no epileptic activity. An unfavorable progression led to her death.

Discussion: Early treatment of prolonged seizures in severe neurological injury is crucial to prevent secondary damage. EEG, the gold standard for seizure diagnosis, is often unavailable in the OR. Neurologic examination is unreliable under GA and neuromuscular blockade.

DSA represents the frequencies and power of the EEG through time, being user friendlier to interpret EEG during GA. Seizures on DSA appear as increased power evolving from lower to higher frequencies.

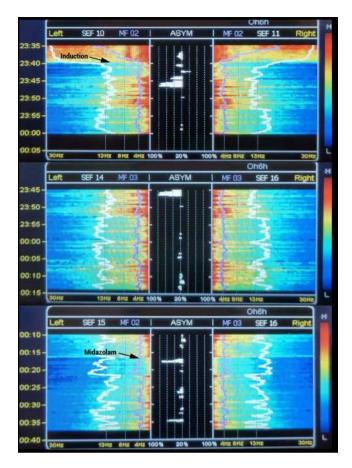
In this case, clinical context and DSA findings justified midazolam use, which partially suppressed epileptic activity.

Reference:

10.1016/j.seizure.2021.06.011

Learning Points: pEEG does not replace traditional EEG, but supports the anesthesiologist in real-time multimodal monitoring Multimodal monitoring should be interpreted in the clinical con-

DSA shows promise but needs more study.



31AP03-3

Anesthetic management of spinal tumor resection via sternotomy approach with intraoperative diagnosis of adrenergic storm

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Background: Paragangliomas (PGs) are rare extra-adrenal neuroendocrine tumors that share histological similarities with pheochromocytomas but differ in their location. Primary PGs of the central nervous system (CNS) are extremely rare, with an incidence of approximately 0.07 per 100,000 individuals (1).

This case report describes a patient who underwent spinal tumor resection at the T3 level, with no prior histological diagnosis, and developed an intraoperative adrenergic storm.

Case Report: A 44-year-old male with a medical history of asthma, hypertension, and prior abdominal tumor resection in childhood was scheduled for spinal tumor resection at the T3 level, associated with a vertebral fracture, accessed via sternotomy. The tumor's histological diagnosis was unknown before surgery. Upon admission, the patient was monitored with standard devices (including bispectral index), and his initial mean arterial pressure (MAP) was 152 mmHg. Anesthesia induction included 35 mcg of sufentanil, 150 mg of propofol, and 70 mg of rocuronium. Central venous access was achieved via the left axillary artery, and invasive blood pressure monitoring was placed in the right radial artery.

Initially, the patient remained stable. However, as tumor manipulation began, persistent hypertension was noted. Initially, inadequate analgesia was suspected, and 10 mcg of sufentanil was administered, but the hypertension worsened. Nitroprusside was given, but the patient's hemodynamic state deteriorated further, with episodes of hypertension (MAP 164 mmHg) alternating with severe hypotension (MAP 36 mmHg), requiring norepinephrine support.

Due to instability, surgery was terminated after 7 hours. The patient was transferred to the ICU, extubated 24 hours later, with stabilized blood pressure and no neurological deficits. Postoperative histological examination confirmed a paraganglioma.

Discussion: PGs can pose significant perioperative challenges due to catecholamine release. Early identification and management, including alpha-blockade, are critical to prevent adrenergic crises during surgery.

Learning Points:

- 1. Consider PG in Unexplained Hypertension
- 2. Prompt Pharmacological Intervention
- 3. Intraoperative adequate Monitoring and Management of the hemodynamics

Reference:

1. Li YH, Shen L. Anesthesia Management in Hereditary Pheochromocytoma and Paraganglioma: Updated Insights into Clinical Features and Perioperative Care. Chin Med Sci J. 2024 Sep 30;39(3):211-216. doi: 10.24920/004360.

31AP03-4

Anesthetic management of a patient with the rare CADASIL syndrome undergoing total hysterectomy

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Background: CADASIL syndrome (Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy) is a rare, genetic condition characterized by alterations in the structure of blood vessels, leading to multiple small strokes and a clinical presentation of dementia. Around 500 families worldwide are affected, the majority of which are in Europe (1). In the present case, we highlight the anesthetic management of a patient undergoing a hysterectomy.

Case Report: A 99 kg, 169 cm woman with CADASIL syndrome and dyslipidemia underwent a total hysterectomy. Her medical history includes multiple strokes without sequelae. She was on daily medication, including aspirin and rosuvastatin.

The anesthesia was performed using spinal anesthesia combined

The spinal block was carried out with thoracolumbar at the L3-L4 interspace. A dose of 14 mg of heavy bupivacaine and 80 mcg of intrathecal morphine were administered.

Sedation was achieved with 5 mg of midazolam and 50 mcg of fentanyl, adjusted as necessary based on the Bispectral Index monitor. Intraoperative stability was maintained. infusion. In the recovery room, the patient was awake, with a Glasgow Coma Scale score of 15, and reported mild pain, which was controlled with 5 mg of IV morphine. The spinal block reached a T10 level, and the patient was transferred to the ICU in good condition.

Discussion: Due to the rarity of CADASIL syndrome, a cautious approach was taken. Sedation was chosen to allow the patient to maintain her own respiratory drive, thereby preserving normocapnia. BIS monitoring was utilized to detect any abnormalities early in its readings, whether in suppression rate, index, or electroencephalogram. Fortunately, throughout the procedure, the BIS remained stable without any changes.

Learning Points: The combination of spinal anesthesia and sedation was successful in the patient, providing adequate pain control and stable recovery. This case report contributes to clinical practice by offering evidence on anesthetic management in patients with this rare and under-reported syndrome, suggesting that this approach can be considered safe and effective in similar clinical scenarios.

References:

1:Bermúdez-Triano M, Guerrero-Domínguez R, Martínez-Saniger A, Jiménez I. General anesthesia considerations in CADASIL disease. Rev Esp Anestesiol Reanim (Engl Ed). 2019 Apr;66(4):226-229. doi: 10.1016/j.redar.2018.10.008. Epub 2019 Jan 18. PMID: 30665799

31AP03-5

Effect of vagus nerve denervation on hemodynamic autoregulation in increased intracranial pressure swine model using real-time recording system: pilot study

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Background and Goal of Study: Cerebral autoregulation (CA) maintains constant cerebral blood flow despite arterial blood pressure (ABP) fluctuations, controlled by the autonomic nervous system (ANS). The vagus nerve, a key component of the parasympathetic branch of the ANS, plays an important role in CA. The effect of vagus nerve denervation on CA remains unclear; thus, this study seeks to examine its impact in a swine model of elevated ICP following bilateral vagus nerve denervation.

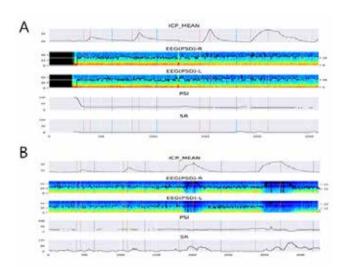
Materials and Methods: Eight male Yorkshire pigs (40.5 ± 0.76 kg, 11-12 weeks old) were divided into two groups (n=4/group): a control group and a vagotomized group, where the latter underwent bilateral cervical vagotomy prior to ICP elevation. ICP elevation was achieved by saline infusion into the lumbar subarachnoid space, progressively increasing ICP to 20, 30, 40, and 50 mmHg until a plateau was reached. Cerebral hemodynamics were monitored in real-time using data collection from ICP, EEG, and ECG, along with assessments of heart rate variability and electroencephalography.

Results and Discussion: During and after the lumbar subarachnoid space infusion, systolic, mean, and diastolic pressure were reported to be lower in the vagotomized group compared to the control group. The high frequency peak was also lower in the vagotomized group (Table). The EEG changes of the vagotomized group showed a decrease of δ wave power, attenuation of total power, and elevation of suppression ratio at ICP 40 mm Hg (Figure).

Conclusion(s): We propose that vagus nerve denervation may not offer a positive influence in the cerebral autoregulation.

	Control group	Vagotomized group	p-value
During lumbar subarachnoid space	infusion		
SBP	97.813 ± 10.816	81.615 ± 10.381	< 0.05
MAP	77.167 ± 10.773	62 ± 11.174	< 0.01
DBP	66.875 ± 10.726	52.263 ± 12.027	< 0.01
After lumbar subarachnoid space in	fusion.		
SBP	99.625 ± 10.809	82.385 ± 9.657	< 0.01
MAP	78.25 ± 10.328	62.538 ± 10.569	< 0.01
DBP	67.5 ± 10.239	52.692 ± 11.426	< 0.01
HF peak	0.259 ± 0.057	0.207 ± 0.049	< 0.05

Values are expressed as the mean ± standard deviation.



31AP03-6 Single-cell RNA sequencing reveals that Cebpb contributes to the surgery-induced cognitive impairment in mice

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Background and Goal of Study: With the global trend of population ageing, the number of elderly patients undergoing surgery is steadily increasing. Postoperative cognitive dysfunction (POCD) is a prevalent complication among elderly patients during the perioperative period. This study explores anaesthesia-induced transcription factor changes at the single-cell level and investigates their molecular roles that mediate postoperative cognitive impairment in aged mice. These findings provide a foundation for targeted therapeutic strategies.

Materials and Methods: Single-cell RNA sequencing was performed on hippocampal tissues from 18-month-old mice subjected to anaesthesia and surgery. Data analysis and visualisation were primarily conducted using R. Additional interventions and validations included primary cell culture, animal modelling, behavioural assessments, in vivo calcium imaging, and other experiments.

Results and Discussion: Hippocampal cells from the control and surgery groups were annotated into nine major cell types. Differential gene expression, functional enrichment, and pseudotime analyses classified microglia into homeostatic (MG0), intermediately stressed (MG1), and pro-inflammatory (MG2) states, which are consistent with microglial cell type identification in the brains of elderly AD patients. Transcriptomic analyses identified significant upregulation of Cebpb across microglial states following surgery. Cebpb dose-dependently enhanced the transcriptional activity of the Unc93b1 promoter.

Upregulation of Cebpb was observed in primary microglial cells and BV2 cells stimulated with LPS, as well as in the hippocampus of surgery mice. Knockdown of Cebpb in the dorsal hippocampus of aged Cx3cr1CreER mice partially restored microglial homeostasis and downregulated mRNA levels of pro-inflammatory

Furthermore, both in vitro and in vivo experiments demonstrated that knocking down Cebpb in microglia alleviated inflammationinduced neuronal structural changes, restored Ca2+ signalling, and improved cognitive performance.

Conclusion(s): In summary, this study provides a comprehensive cellular-level molecular profile of the hippocampus following surgery in aged mice. It highlights the pivotal role of Cebpb in mediating POCD through the regulation of microglial activation states. Acknowledgements: This work was supported by the National

Natural Science Foundation of China and the Scientific Research Fund of Shanghai Fourth People's Hospital.

31AP03-8

The dynamic range of the EEG spectral slope between vigilant states decreases with age

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Background: Over the next decade, the aging population will lead to a rise in surgical procedures requiring general anaesthesia, often involving patients with increased brain vulnerability. Intraoperative electroencephalographic (EEG) monitoring enables the individualised administration of analgo-sedative medications. Age-related neurophysiological changes are known to impact EEG patterns.

We examined changes in EEG spectral slope across various states of vigilance during general anaesthesia across different age groups. The dynamic range of spectral slope observed in EEG recordings from distinct anaesthesia states provides insight into age-related neurophysiologic changes.

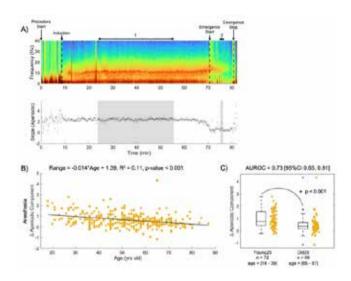
Methods: We retrospectively analysed 324 recordings of EEG during maintenance and emergence from anaesthesia (ages: 18-87 years old). Our analysis focused on the central 30-minute maintenance interval, and the central minute between emergence start and end (Fig. 1A).

For these intervals, we calculated power spectra and applied the "fitting oscillations & one over f" algorithm to obtain the EEG's aperiodic component (spectral slope). We determined the median dynamic range for each subject as the difference between the emergence and maintenance spectral slope.

Results and Discussion: The dynamic range of spectral slope during anaesthesia decreased linearly with age (Range=-0.014*age+1.39; R2=0.11) (Fig. 1B).

The youngest quartile of the subjects showed a significantly higher dynamic range than the oldest quartile. Age had a "very strong" effect on the dynamic range (Young25: 0.92[0.42, 1.35], Old25: 0.47[0.18, 0.66], p<0.001, AUC:0.72[0.64, 0.80]) (Fig. 1C).

Thus, the young brain expressed a larger dynamic range, i.e., a stronger change in EEG spectra between the more "awake" (anaesthesia maintenance) and more "sleepy" (emergence) state than the old brain.



Conclusion: Our findings revealed a reduced dynamic range between different vigilance states in older subjects during anaesthesia, indicating age-related alterations in brain dynamics. These insights have the potential to support the individualized monitoring and administration of anaesthetic agents across diverse age groups.

31AP03-9 Optic nerve sheath ultrasound during electroconvulsive therapy

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Background and Goal of Study: Electroconvulsive therapy (ECT), which is applied by producing a seizure with an electrical current under general anesthesia, is an effective and reliable method in the treatment of most psychiatric diseases. Nevertheless, how the treatment affects neuronal mechanisms is controversial.

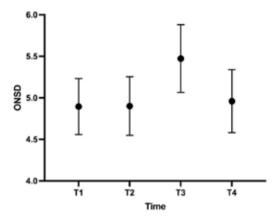
In this study, we aimed to evaluate the changes in cerebral physiology caused by ECT stimulus and induced seizure activity in real time by ultrasound-guided optic nerve sheath diameter measurement, which is a simple, non-invasive and inexpensive method.

Thus, the primary outcome of the study was to determine the change in ONSD value during the postictal period compared to baseline. Secondary objectives include identifying patient and ECT procedure-related factors affecting ONSD.

Materials and Methods: Thirty-nine patients were included in the study and ONSD measurements were performed on all patients four times: before and after anesthesia induction, after ECT (postictal), and during the recovery phase.

Age, weight, height, psychiatric diagnoses, medications and comorbidities, blood pressure and heart rate values, and motor seizure durations were recorded.

Results and Discussion: Postictal ONSD measurement was found to be statistically significantly higher than measurements in the pre-induction, post-induction and recovery periods (p<0.001) (mean values were 5.47 mm, 4.89 mm, 4.90 mm and 4.96 mm respectively) (Figure 1). The change in ONSD during ECT was significantly higher in patients with pre-existing hypertension than in those without hypertension (p=0.001). Additionally, increased blood pressure and increasing age were positively correlated with ONSD.



Conclusion(s): In patients with an indication for ECT and without an intracranial space-occupying lesion, ECT procedure may cause a transient increase in intracranial pressure (ICP). This change in ICP may be more pronounced in patients with a diagnosis of hypertension.

31AP03-10

Subcortical connectivity patterns during introduction of non-rapid eye movement sleep (NREMS) and isoflurane-induced loss of responsiveness are partly different in mice

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Background: Anesthesia and NREMS may be seen as two distinct entities, although sharing physiological and behavioral similarities. As both processes are not fully understood, identifying common neuronal mechanisms may help optimizing anesthetic regimes. This study investigated functional neuronal connectivity between nuclei from the sleep/wake-promoting pathway (SWP) during wake/NREMS/wake transitions, and during isofluraneinduced (IA) loss (LOR) and recovery (ROR) of responsiveness. Similar neuronal activities in central nuclei of the SWP during these transitions may point towards an active role of the SWP in LOR and ROR.

Methods: Twelve male C57BL6/N mice were implanted with local field potential (LFP) electrodes in the ventrolateral preoptic nucleus (VLPO) and the locus coeruleus (LC) to monitor neuronal activity, as well as EEG electrodes to monitor sleep/wake behavior. Chronic recordings were performed simultaneously, including two baseline days and IA. Sleep/wake behavior was scored and all wake/NREMS/wake transitions were identified.

Functional connectivity between VLPO and LC during wake/ NREMS/wake, LOR and ROR were analyzed using coherence, inter site phase clustering (ISPC), and Granger casualty (GC) analyses. Significance was set at 95% (Wilcoxon signed rank test).

Results and Discussion: LFP data revealed increased coherence between VLPO and LC during NREMS and a decrease during wake. Coherence between the two nuclei decreased after LOR, compared to pre-LOR. During ROR, coherence did not change significantly. Analogous to coherence for wake/NREMS, ISPC between VLPO and LC showed an increase during NREMS and a decrease during wake. ISPC across LOR and ROR did not vary significantly. GC analysis between VLPO and LC during wake and NREMS revealed a bidirectional influence between VLPO and LC. VLPO activity granger caused LC activity during NREMS. At specific frequency bands, LC granger caused VLPO activity during wake and NREMS.

After LOR, the GC index from VLPO to LC increased partly. The study supports literature on functional VLPO/LC connectivity during wake/NREMS transitions, while the two nuclei seem to have at least a less prominent participation in LOR and ROR.

Conclusion: An active role of LC and VLPO in LOR and ROR remains unclear, based on the present results. At present we perform identical experiments together with a selective manipulation of the nuclei to gain a more detailed picture of neuronal dependencies during the transitions.

31AP03-11 Contrast-induced encephalopaty: a case report

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Background: Contrast-induced encephalopathy (CIE) is a rare neurological complication caused by direct neurotoxicity from the use of radiological contrast agents. The occurrence of this condition has been documented following both diagnostic procedures (e.g., CT scans) and therapeutic interventions (e.g., cardiac catheterization or cerebral angiography). The estimated incidence is low, around 0.3-2%, although it is believed to be increasing due to the more frequent use of radiological contrasts.

Case Report: We present the case of a 73-year-old woman with a history of hypertension, type II diabetes, dyslipidemia, and steatohepatitis, who underwent endovascular exclusion of an aneurysm in the left internal carotid artery. The procedure was performed under general anesthesia (TIVA) without incidents. Upon extubation, the patient exhibited difficulty connecting with her surroundings. Upon arrival at the ICU, she presented moderate psychomotor agitation, an unintelligible gaze, did not obey commands, and had mixed aphasia, receiving a GCS score of 9-10. A non-contrast CT scan showed blurring of the sulci predominantly in the left frontoparietal region, with asymmetry compared to the contralateral cerebral convexity, without signs of ischemia or hemorrhage. The patient was closely monitored, receiving fluid therapy and corticosteroids. Over the next 48 hours, she maintained the same clinical presentation, with newly developed right hemiparesis. At 72 hours, the patient showed progressive improvement and regained consciousness without motor focality, leading to her discharge from the unit with a diagnosis of CIE.

Discussion: The differential diagnosis of altered consciousness or neurological focality, which are the most common symptoms of CIE. is of great clinical interest. Since it is a diagnosis of exclusion. a high clinical suspicion is needed after ruling out more common complications such as stroke and posterior reversible encephalopathy syndrome.

Therefore, understanding the clinical features and diagnosis of this condition is particularly relevant. Even more importantly, knowledge of its evolution is crucial, as, unlike other conditions, it typically has a good prognosis with complete neurological recovery within 24-72 hours.

Reference:

DOI: 10.1016/j.nefro.2023.05.007

Learning Points: CIE is a rare neurological condition caused by the use of radiological contrast agents that should be suspected if altered consciousness is presented after its use.

31AP03-12

Alzheimer's disease polygenic risk scores applied to a surgical population

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Background and Goal of Study: Alzheimer's Disease (AD) polygenic risk scores (PRS) have emerged as valuable tools for predicting AD and identifying its preclinical stages. Previous research has demonstrated that surgery and anesthesia may accelerate cognitive dysfunction in individuals within the preclinical stages of AD. Early identification of patients at elevated risk for AD could facilitate the implementation of preventive measures and targeted treatment strategies, potentially altering the disease trajectory and improving perioperative cognitive outcomes.

This study assessed the feasibility and utility of applying AD-PRS to a surgical patient population within the Mass General Brigham (MGB) health system.

Materials and Methods: Data was obtained from the MGB Biobank, a repository of biospecimens and clinical data approved by the MGB Institutional Review Board. We included patients aged 40-89 years with current procedural codes for anesthesia and no documented AD diagnosis before surgery. AD-PRS derived from previous genome-wide association studies were applied to this cohort, and subsequently, a PRS-based phenome-wide analysis was conducted.

Results and Discussion: A total of 33,526 patients (median [IQR] age, 67 [19] years; 54% females) were identified. The distribution of AD-PRS within the cohort followed a normal distribution, with 3,352 patients presenting scores above the 90th percentile, Fig-

Our PRS-based phenome-wide analysis confirmed the genetic link between increased AD-PRS and its phenotypical expression, Figure 2.

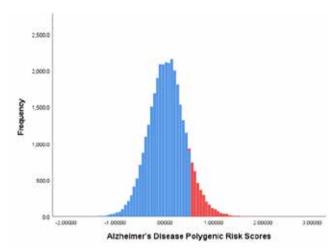


Figure 1.

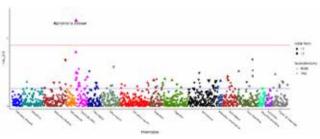


Figure 2.

Conclusion(s): The application of AD-PRS in surgical populations demonstrates potential for enhancing preoperative risk stratification. Identifying patients at increased genetic risk for AD may enable the development of targeted interventions aimed at increasing resilience against the cognitive challenges associated with surgery.

31AP04-1

Investigating the effect of age on the EEG's first-digit distribution during wakefulness and sevoflurane anaesthesia

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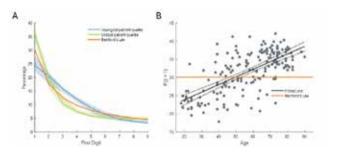
Background: Time-domain analyses, e.g. entropies, capture nonlinear information from EEG signals and reliably track consciousness levels. An alternative, yet less established, approach examines the first-digit distribution of EEG amplitudes, i.e., the probabilities of the leftmost non-zero digits. This is based on Benford's Law, which predicts a logarithmic distribution of leading digits 1-9. First-digit distributions of EEG signals differ between wakefulness and general anaesthesia while maintaining a Benford-like behaviour [1].

As age influences EEG patterns during general anaesthesia [2], we aimed to examine how age affects these distributions during different consciousness levels.

Methods: We retrospectively analyzed frontal EEG from 111 subjects aged 17-71 during resting wakefulness [3] and 180 patients aged 18-90 under sevoflurane anaesthesia without surgical stimulation [2]. 30 seconds of artefact-free, non-burst suppression EEG were used to derive first-digit distributions. Median absolute deviation (MAD) and sum of squared differences (SSD) were computed as effect sizes to compare distributions between age groups. Linear regression was used to examine age-related changes in the probability of specific digits.

Results: During wakefulness, first-digit distributions showed no significant differences between the youngest and oldest patient quartiles (MAD=0.0036, SSD=3.33), and linear regression revealed no age-related effects. During anaesthesia, however. MAD and SSD indicated differences between the age groups (MAD=0.0324, SSD=192.52; Fig. A).

The most pronounced deviation was in the probability of the digit '1', which increased significantly with age (P(d=1)=19.70+0.21*age, p<0.001, R²=0.45; Fig. B).



Conclusion: Our findings highlight the need to account for age when using first-digit distributions as an analytical tool in EEG research. Future research should investigate whether analysis of leading digits in the EEG can track unconsciousness in individual patients.

References:

- 1. Kreuzer et al., Anesth Analg. 2014 Jan;118(1):183-91.
- 2. Kreuzer et al., Anesthesiology. 2020 May;132(5):1003-16.
- 3. Hatlestad-Hall et al., Data Brief. 2022 Oct 1:45:108647.

31AP04-2

Intraoperative continuous non-invasive evaluation of cerebral compliance and correlation with early postoperative cognition status in elderly patients undergoing surgery in Trendelemburg position: an observational study

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Background and Goal of Study: The Trendelenburg position can impair cerebral venous return, increasing intracranial pressure (ICP) and potentially contributing to postoperative cognitive dysfunction (POCD). As routine invasive monitoring of ICP intraoperatively is unfeasible, this study aimed to evaluate cerebral compliance as a non-invasive surrogate, its correlation with optic nerve sheath diameter ultrasound (ONSD), and its association with POCD in elderly patients.

Materials and Methods: After Institutional Ethics Committee approval, a prospective observational study was conducted on 48 male patients aged over 40 undergoing general anesthesia for laparoscopic or robotic prostatectomy in the head-down tilt position. In addition to hemodynamic and respiratory monitoring, processed EEG (SedLine®), optic nerve sheath diameter ultrasound, cerebral oximetry (O3®), and cerebral compliance (Brain4Care®) were measured throughout surgery. Brain4Care® assesses skull movement, with a P2/P1 ratio > 1.2 indicating increased ICP. Cognitive function was evaluated using the Montreal Cognitive Assessment (MoCA) pre- and postoperatively.

Data were analyzed using the t-test with Welch's correction and the Mann-Whitney test, with effect sizes calculated using Cohen's d and rank-biserial correlation. In addition, mixed-effects modes, accounting for variability between subjects and repeated measures were used to predict outcomes. Significance was set at P < 0.05.

Results and Discussion: The mean age of participants was 64.60 ± 8.67 years. Intraoperative P2/P1 ratios > 1.2 were observed in 39.5% of patients. Mixed-effects modeling identified significant predictors of cerebral compliance changes, including patient weight (OR 0.93, P < 0.001), surgery duration (OR 4.05, P = 0.03), mean arterial pressure (OR 1.04, P < 0.001), and heart rate (OR 1.03, P = 0.04). Age (OR 13.3, P < 0.001) and surgery duration (OR 1.32, P < 0.001) were significant predictors of postoperative cognitive impairment in the same model.

Conclusion(s): Trendelenburg positioning during prostatectomy in elderly patients was associated with reduced cerebral compliance, suggesting a transient rise in ICP. Non-invasive cerebral compliance monitoring may facilitate early detection and management of ICP increases, though further studies are required to confirm these findings.

31AP04-3

Delayed emergence from anesthesia after cranioplasty: a case report

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Background: Cranioplasty is usually performed following decompressive craniectomy, which is aimed to alleviate cerebral swelling or herniation in traumatic brain injury. Primary reasons for cranioplasty are brain protection and cosmetic considerations, or to relieve the syndrome of trephine.

Case Report: This 67-year-old female with a history of right fronto-temporal intracranial hemorrhage(ICH) s/p craniotomy and cranioplasty in 2001, and recent traumatic brain injury(TBI) with right fronto-temporal large ICH s/p craniotomy, was admitted for scheduled cranioplasty. In OR, she was clear and oriented. Anesthesia induction was performed smoothly. Fentanyl was administered for intraoperative hypertension. Surgery lasted for 2 hours without complication. However, she had no response to painful stimuli, and constricted pupils were found. Naloxone was given to reverse opioid overdose. She was then extubated with eye opening to pain, acceptable neuromuscular reversal and intact gag reflexes. GCS score remained E2V1M3 at PACU. There was no electrolyte imbalance, hypoglycemia or hypercapnia. Clinical diagnosis was in favor of delayed emergence. To rule out emergent causes requiring surgical intervention, brain CT revealed right frontal epidural hematoma, 6.6mm. No acute ICH or brain swelling was noted. Further EEG revealed no epileptiform activity. She was discharged in her baseline cognitive function one week afterwards.

Discussion: Cranioplasty is considered a straightforward procedure; however, it carries the potential for unforeseen complica-

Although no specific cause for the prolonged altered consciousness was identified, the patient did exhibit impaired consciousness, which continued to significantly affect both patients and

We speculated that previous TBI with involvement to the prefrontal cortex was likely to play a role in delayed awareness.

Reference:

Edlow et al. Recovery from disorders of consciousness: mechanisms, prognosis and emerging therapies. Nat Rev Neurol 17, 135-156 (2021).

Learning points: Previous traumatic brain injury with involvement to the prefrontal cortex may lead to delayed emergence following cranioplasty.

31AP04-4

First steps to a novel method to quantify cerebral autoregulation efficacy continuous and real time

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Background and Goal of Study: Cerebral autoregulation (CA) efficacy can be quantified from the phase difference between blood pressure (BP) and middle cerebral artery flow velocity (MCAV) oscillations. When CA is present MCAV oscillations will lead BP oscillations (phase lead is positive) and when CA is absent both oscillations will parallel (i.e. phase lead tends to 0 degrees). Intra operatively, BP oscillations can be induced by intermittent positive pressure ventilation (IPPV).

Since it takes approximately 5 seconds for CA mechanisms to become operative, the BP oscillation frequency, needed to assess CA, has to be significantly slower that 0.2 Hz.

Our goal is to develop at tool to assess CA continuously intraoperatively.

Therefore, we ventilated patients with 8min-1 (0.125Hz) throughout a surgical procedure where longstanding deep hypotension is required. This enabled us to quantify CA every minute during the whole procedure.

We hypothesized that at normotension the phase lead is positive. towards 30 degrees, and at hypotension, defined as BP below the lower limit of the CA (LLCA), this phase lead will decrease towards 0 degrees, indicating impaired CA.

Materials and Methods: Continuous mean BP and the mean MCAV of 15 patients were monitored during surgery, with a ventilation rate of 0.125 Hz. The LLCA for each patient was assessed to determine the blood pressure where the CA is impaired (left to the LLCA), and intact (right to the LLCA).

Next, the phase lead was calculated every 60 s, based on 120 s of data. The derived phase leads corresponding to a BP below the LLCA, minus 10 mmHg, and above the LLCA, plus 10 mmHg, were averaged. Data are expressed as median (25th-75th percentile). Results and Discussion: Based on 15 patients, the median LLCA

was located at 56 (49 to 66) mmHg. Right from the LLCA, the median phase lead was 22 (15-28). Below the LLCA the phase lead was lower with 11 (5-15, p<0.01).

Conclusion: These preliminary results show that the CA can continuously be quantified, applying a ventilation frequency of 8min-1. Additional, a phase lead above 15 degrees might indicate a functioning CA, whereas a phase lead below it might indicate an impaired CA, but this should be assessed with more patients.

31AP04-6

The effect of intranasal dexmedetomidine on surgical field quality and hemodynamic stability in transnasal transsphenoidal pituitary surgery

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Background and Goal of Study: Dexmedetomidine is an α 2adrenoreceptor agonist that provides sedation and sympatholysis, but also causes peripheral vasoconstriction. Intranasal dexmedetomidine has been explored for optimizing the surgical field in transsphenoidal pituitary surgery, though evidence is limited. This study compares the effects of adrenaline alone to a combination of adrenaline and dexmedetomidine, both applied locally to the nasal mucosa.

We hypothesize that the combination will improve surgical field conditions, particularly regarding mucosal bleeding, as well as reduce hemodynamic fluctuations.

Materials and Methods: We enrolled 24 participants, randomly assigned to two groups: Group C (control), receiving nasal preparation with one round of normal saline cotton strips and one round of adrenaline; and Group D, receiving one round of dexmedetomidine cotton strips and one round of adrenaline.

The primary endpoints were surgical field quality, assessed using Wormald's grading system at various stages (endoscope insertion, mucosal preparation, sphenoid bone drilling, tumor excision, and end of surgery), and hemodynamic stability, measured by mean arterial pressure (MAP) and heart rate (HR).

Secondary endpoints included the need for esmolol infusion to manage hypertension, tachycardia, or poor surgical field quality. Continuous data were analyzed using t-tests or Mann-Whitney U tests, and hemodynamic differences were assessed using repeated-measures ANOVA.

Results and Discussion: No significant differences in Wormald's scores were observed between the groups at any surgical stage. Hemodynamic parameters also showed no significant differences. The use of esmolol did not differ significantly between groups. These results may be due to the small sample size or the lack of additional benefit from combining dexmedetomidine with adrena-

Conclusion(s): Adding dexmedetomidine to adrenaline did not improve surgical field quality or hemodynamic stability in transnasal transsphenoidal pituitary surgery.

Nevertheless, larger randomized controlled trials are needed to confirm these findings.

Future studies comparing dexmedetomidine alone to adrenaline could provide further insight into its potential benefits. We also propose studying patients with acromegaly or Cushing's disease separately as the degree of bleeding may be exaggerated in these cases.

31AP04-7

Use of processed EEG in the ICU: enhancing real-time patient care and gaining insights into brain activity during sedation

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Background: Processed electroencephalography (pEEG) has been used to assess the depth of anaesthesia in surgical settings. Its application has recently extended to the Intensive Care Unit (ICU) to monitor brain function in sedated patients. This case series explores retrospective EEG data to understand brain activity during sedation.

Case Report: This retrospective case series was conducted in three patients from a general ICU at Spital Limmattal (Schlieren, Switzerland). The dataset included pEEG records of ICU patients sedated with a protocol involving propofol, ketamine, and sufentanyl. Neuromuscular blocking drugs were not used. EEG recordings were visually analysed, focusing on delta (0.5-4 Hz) and extended alpha (7-12 Hz) frequency ranges. Visual analyses identified stable or cyclical alpha power and transition to low-beta (12-25 Hz) states. Only patients who had provided general consent for data use were included.

Discussion: Preliminary analyses revealed consistent sustained power in the delta frequency range during sedation. The alpha range displayed variability, with some patients showing alphadelta patterns similar to general anaesthesia, while others experienced intermittent alpha power loss reminiscent of natural sleep. Stable EEG patterns in the delta range and variations in the alpha and beta ranges highlight individual responses to sedation protocols.

Image:

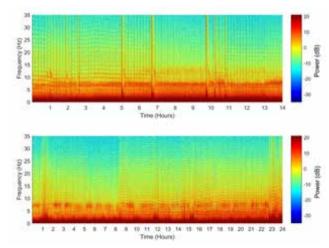


Image 1: Density Spectral Array (DSA) showing variations in alpha power during sedation. Above resembling general anesthesia and below resembling cyclical alpha power changes.

Learning Points: pEEG monitoring in the ICU offers valuable real-time data to optimise sedation management, enhancing outcomes beyond traditional clinical assessments. The ability to detect specific EEG patterns provides insight into sedation depth and patient variability.

31AP04-8

Intraoperative neurophysiological monitoring: Prediction of motor deficits by transcranial motor evoked potentials in supratentorial oncological surgery

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Introduction: Motor neurological morbidity associated with supratentorial brain oncology leads to a worse quality of life. For this reason, intraoperative motor evoked potentials (MEPs) and their stability during the surgical procedure promote surgical safety. However, transcranial electrical brain stimulation (TCMEPs) occurs in an undetermined area between the cerebral cortex and the internal capsule due to brain conductivity. Therefore, the relevance of isolated TcMEPs for predicting motor deficit in this type of procedure remains to be investigated.

Objective: To describe and correlate the presence of alarm criteria obtained in the TcMEPs and the presence of motor deficits 48 hours after supratentorial oncological surgery.

Methodology: A retrospective and observational study was carried out on a convenience population of patients who underwent craniotomy for supratentorial oncological pathology between July 2013 and

2023. The presence of alarm criteria in the TcMEPs was identified as follows: a peak-to-peak amplitude decrease of at least 50% in muscles contralateral to the craniotomy during the tumor resection period. Motor deficits at 48 hours were clinically assessed in comparison with preoperative deficits, using the Medical Research Council muscle strength scale. Anaesthetic induction was achieved using a bolus of muscle relaxant for intubation purposes and maintained with Target Controlled Infusion of propofol and remifentanil to maintain adequate hipnose (bis) and hemodinamic stability. A descriptive analysis of the sample and a correlation between the presence of alarm criteria and clinical motor deficit were performed.

Results: 211 patients were revised, 9 of whom were excluded due to insufficient records. The sample consisted of 202 patients with a median age of 55.5 years and an interquartile range of 22.25 years. TcMEPs warning signs occurred in 40 patients, of whom 25 (12% of the total) did not show new motor deficits in the immediate postoperative period. Patients with changes in TcMEPs showed a difference in the mean score of -1.12 (+/-1.5) on the muscle strength scale compared to the pre-surgical moment (vs0.28+/-0.79 in patients without changes in TCMEPs). The correlation between changes in TCMEPs and new motor deficits was moderate (rpb=-0.324.p<0.001).

Conclusion: Changes in TcMEPs during neurosurgical resection of supratentorial tumors correlate moderately with the presence of new motor deficits in the immediate postoperative period.

31AP04-9

Effects of positive end-expiratory pressure (PEEP) on cerebral arterial and venous flows in septic patients: Transcranial colour-Doppler ultrasound (TCCD) analysis

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Background and Goal of Study: Increased intrathoracic pressure can reduce cerebral venous outflow, leading to elevated intracranial pressure (ICP) with a reduction in cerebral perfusion. Monitoring these effects are of considerable interest. The primary goal of the study was to evaluate the impact of PEEP on the arterial and venous cerebral systems in septic mechanically ventilated(MV) patients.

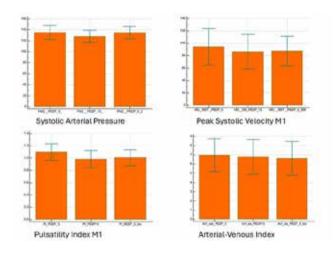
Materials and Methods: An observational case series was conducted on 12 septic MV patients; informed consent was obtained. We measured Driving Pressure (DP). Systolic Arterial Pressure (AP), velocity (PSV) in the cerebral middle cerebral artery (MCA) and Rosenthal vein (RV), Pulsatility Index (PI), and Arteriovenous Index (AVI). The AVI between MCA and RV is a parameter used to differentiate vasospasm from hyperperfusion, helping evaluate cerebral circulation. Measurements were taken at different levels of PEEP (P): 5 cmH2O, 15 cmH2O, and then returning to 5 cmH2O. The study adhered to the STROBE guidelines(1).

Results and Discussion: Results are shown in Table 1 and Figure 1. No significant variations were found in hemodynamic parameters, arterial and venous velocity, or the AVI index between the PEEP levels. This suggests that in septic patients with respiratory failure and hemodynamic stability, increasing PEEP to reduce DP does not appear to compromise cerebral circulation or cause intracranial congestion.

Conclusion: This study has limitations, including the small sample size and the lack of measurement of PaCO₂ variations. Future research could focus on evaluating patients with hemodynamic

The analysis of AVI is a simple and useful tool for monitoring signs of vascular congestion. TCCD allows for the rapid detection of venous circulation and is a suitable method for bedside monitoring of cerebral perfusion.

Patients	1	2	3	1	5	6	7	8	9	10	11	12
i auciiis			<u>J</u>						<u> </u>	10		12
DP-AP P5	18-150/83	12-140/85	12-106/60	10-130/70	10-148/80	10-156/74	10-103/50	8-165/84	12-130/70	11-118/64	11-155/55	8-120/50
DP-AP P10	18-130/75	12-118/78	14-120/70	15-128/70	10-130/77	11-130/72	10-106/60	11-158/68	12-125/70	11-120/65	11-143/58	12-105/55
DP-AP P10-5	18-156/82	12-138/78	11-102/55	10-134/68	10-145/71	10-145/71	10-120/60	8-162/69	12-132/68	11-115/65	11-145/57	8-118/56
PSV-PI P5	147-1.05	62-0.79	61-1.01	90-1.41	121-0.9	60-1.17	76-1.47	209-1.18	76-1.05	105-0.85	57-1	51-1.29
PSV-PI P10	125-1.02	63-0.79	42-0.72	79-1.28	116-0.8	75-1.03	54-1.49	200-0.96	82-1.02	93-0.78	53-0.85	53-1.06
PSV-PI P10-5	136-1.05	62-0.9	52-0.71	84-1.36	115-0.8	80-1.08	63-1.36	170-1.16	74-0.85	105-0.93	49-0.83	49-1.03
AVI P5	8,9	5,2	3,8	5,3	10,3	4,3	3,5	6,4	12,9	8,4	7,7	7
AVI P10	6,2	5,3	3,6	4,2	9	4,2	5,4	4,4	13,4	10,3	8,8	6,7
AVI P10-5	8,4	5,4	2,9	5,3	9,8	3,5	5,1	4,1	12,6	8,8	7,4	6,2



Reference:

1. Cuschieri S. The STROBE guidelines. Saudi J Anaesth. 2019 Apr;13(Suppl 1):S31-S34.

31AP04-10

latrogenic stroke and intracranial hemorrhage: complications of intraauricular hyaluronic acid augmentation

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Background: The rising popularity of hyaluronic acid injections for facial aesthetics, rhinoplasty, and intraauricular procedures has unfortunately been accompanied by an increase in the number of reported severe adverse events, including stroke caused by cerebral embolism and vision loss.

Case Report: This is a tragic case of a 36-year-old female who underwent bilateral grommet removal and bilateral hyaluronic acid injection tuboplasty. Patient developed left gaze palsy, left central facial palsy, and left limb paralysis after surgery.

Initial brain CT did not reveal any obvious problems like bleeding or a typical stroke. However, the lack of improvement prompted further investigation with an MRI, which revealed embolic ischemic stroke in the right internal carotid artery (ICA) territory, with evidence of hemorrhagic transformation.

Despite the initial diagnosis and treatment with aspirin, the patient's condition deteriorated rapidly. Emergent CT scan showing significant edema and hemorrhage in the right frontal-parietal lobe, leading to midline shift. A bilateral craniectomy was performed, along with a right temporal lobectomy to relieve pressure. An intracranial pressure (ICP) monitor and a Kocher's external ventricular drain (EVD) were also placed. Intraoperatively, the brain was noted to be swollen and under high pressure, accompanied by hypotension. Norepinephrine and vasopressin were administered throughout the procedure. Despite efforts, the ICP elevated at 88 mmHg. Tragically, the patient developed bilateral pupil dilation, a grim prognostic sign, and passed away two days later.

Discussion: This case highlights the potential for rare but serious complications associated with hyaluronic acid injections, even in seemingly low-risk procedures. While the exact mechanism of injury remains unclear, it is possible that the injection led to an embolic stroke, potentially due to accidental intra-arterial injection.

Reference:

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Learning points: While hyaluronic acid injections are generally considered safe, there is a small chance of serious complications, including stroke.

31AP04-12

Predictive factors of extubation failure in brain injured patients: a clinical descriptive study

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Background and Goal of Study: Acute brain injury is a common condition in the emergency department, often requiring intubation and mechanical ventilation to protect the airway. Extubation in brain-injured patients is a challenging process with a high failure rate, leading to delayed extubation, prolonged mechanical ventilation, and increased morbidity and mortality. The optimal timing for extubation remains a controversial issue with significant medical and economic implications.

This study aimed to identify predictive factors for extubation failure in brain-injured patients based on our local experience.

Materials and Methods: We conducted a prospective descriptive and analytical study of patients with acute brain injury requiring at least two days of mechanical ventilation.

The study was carried out in the surgical intensive care unit of the Anesthesiology and Intensive Care Department at Ibn Rochd Hospital, Casablanca, over a 54-month period from January 2019 to June 2023.

Results and Discussion: The study included 165 patients, with a mean age of 40 years and a male predominance (sex ratio 4.15). Traumatic brain injuries accounted for 78.2% of cases. Subarachnoid hemorrhage was the most common injury (39.4%), followed by epidural hematoma (34%) and subdural hematoma (23.6%). Most patients (91.5%) were intubated on the first day of hospitalization. The extubation failure rate was 31.5%. Predictive factors for failure included low Glasgow Coma Scale (GCS) scores at admission, bilateral mydriasis, the presence of intraventricular hemorrhage, subdural or epidural hematomas, delayed weaning, unresponsiveness to simple commands, GCS scores ≤10 before extubation, absence of protective airway reflexes, a facial VIS-AGE score <3, and a low CRS-R visual score.

Extubation failure significantly increased mechanical ventilation duration (15.65 vs. 6.93 days), ICU stay (23.27 vs. 11.77 days), ventilator-associated pneumonia (41.2% vs. 2%), and ICU mortality (88.9% vs. 11.1%), with all comparisons showing p<0.001.

Conclusion(s): This study demonstrates that a thorough neurological evaluation, including assessment of airway protective reflexes, consciousness levels (VISAGE and CRS-R scores), visual pursuit, and responsiveness to commands, can predict extubation success. Early identification of these factors can reduce delayed extubation and its associated complications.

31AP05-1

Effect of cerebral oxygenation on outcomes of patients with ruptured intracranial aneurysms undergoing endovascular embolization: a prospective observational study

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Background Goal of Study: Subarachnoid haemorrhage secondary to ruptured intracranial aneurysms compromise cerebral perfusion and oxygenation, threatening optimal cerebral function. This study explored the role of regional cerebral oxygenation monitoring in predicting outcomes in these patients.

Goal of Study: To detect and capture cerebral desaturation episodes during embolization of anterior circulatory aneurysms and its effect on incidence of vasospasm, duration of the hospital stay, morbidity and outcomes at discharge.

Materials and Methods: 52 adult patients scheduled for coiling of ruptured anterior circulation aneurysms were studied. Bilateral regional cerebral oxygen saturation (rScO2) was recorded in these patients using Near infrared spectroscopy(NIRS) sensors undergoing endovascular embolisation under general anaesthesia, rScO2 values were continuously monitored and recorded throughout the procedure at 10-minute intervals.

Data regarding the vital parameters and bilateral NIRS collected at every 10 minutes till the end of the procedure.

Cerebral desaturation episode (CDE) was defined as a drop in rScO2 by 20% from baseline.

patients were monitored with a 24-hour Glasgow Coma Scale (GCS) during hospital stay and a Glasgow Outcome Scale Extended (GOSE) scale at discharge.

	tpsilateral CDE		COE		GLOBAL Average CDE	
Outcome	Hegression spellident (95% CI)	p-varie	Forgression coefficient (95% CI)	p-veaue	Hogression coefficient (96% CII)	p-vonue
AGUITHUR VESOSORISM	-0.005 (-0.561.0.352)	0.722	(10.002.77.76)	E.001	27.86 (10.3,44.82)	0.002
Mean factor (SCS)	-0.199 [0.448,0.049)	0.313	-0.68 £ (.212, -0.180)	0.011 *	(12), 4(7)	0.011
DOSE was at Docharge	-0.495 (+1.211, (1.319)	9.251	-1.797. (A 508 -0.087)	*	-13 (-531 -00h	0.040
Length of hospital stay	5.511 (0.008, 6.965)	0.046 *	12,919 (5.965, 19.872)	<0.001 ★	12:52 (5:97,19.87)	+C, 001

Results and Discussion: Among the 52 recruited patients, ten patients had CDEs.

Among 10 patients CDE, 5 patients had ACOM aneurysm, and among the other 5 had MCA and ICA aneurysms.

Reasons for CDE in ACOM aneurysms were coil prolapse into ACA, Left ACA filling defect post coiling due to occlusion, catheter induced aneurysmal perforation, and during placement of first coil and the final coil.

Increased frequency of CDEs correlated with increased vasospasm, lower mean motor score, GOSE score at discharge and increased length of hospital stay.

Conclusion(s): The frequency of CDEs and the trend of decline in rScO2 from the baseline are predictive of an endangered hypoxic brain prone to secondary brain injuries, which guides the institution of prompt corrective measures.

31AP05-5

Comparing two baseline mean arterial pressure (MAP) reference values (admission vs. historical) with cerebral oximetry index (COx)-derived optimal mean arterial pressure (MAP opt) to determine the best baseline reference for intraoperative blood pressure management in neurosurgery

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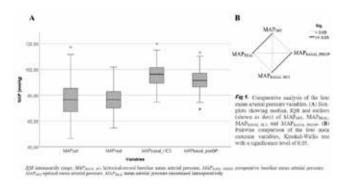
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Background and Goal of Study: MAP fluctuations outside cerebral autoregulation (CA) range are frequent during surgery and linked to complications. COx-derived MAP opt supports individualized MAP management to preserve CA.

This study compared admission vs. historical MAP reference values with COx-derived MAP opt to identify the optimal baseline reference for neurosurgical procedures.

Materials and Methods: This retrospective study included adult patients who underwent elective brain and spinal surgeries between 2019 and 2023 at Hospital Clínic Barcelona. We reviewed the ABP electronic recordings within the Història Clínica Compartida de Catalunya (HC3) database for the two years preceding surgery and calculated the baseline mean arterial pressure (MAP $_{\mbox{\tiny BASELINE HC3}}$). This method was compared to an alternative approach based on the mean of three blood pressure measurements taken preoperatively (MAP_{BASELINE PREOP}). Differences between both methods, the COx-derived optimal mean arterial pressure (MAP OPT), (ICM+® software), and the real mean arterial pressure maintained during surgery (MAP_{REAL}) were assessed.



Results and Discussion: A total of 123 patients were included. $\mathsf{MAP}_{\mathsf{BASAL}\;\mathsf{HC3}}$ data were available for 86 patients (56%), of whom 34 (40%) had only one recording and 52 (60%) had two or more.

We found that the median (IQR) MAP $_{\rm BASAL_HC3}$ [96 mmHg (89-102)] and MAP_{BASAL PREOP} [91 mmHg (86-97)] were significantly higher than both MAP_{OPT} [77 mmHg (67-86)] and MAP_{REAL} [77 mmHg (70-83)] (p < 0.001, Kruskal-Wallis test). No significant differences were found between $MAP_{BASAL\ HC3}$ and $MAP_{BASAL\ PREOP}$ or between MAP and MAP The median (IQR) COx was 0.21 (0.09-0.28), and 97 patients (79%) had a mean COx <0.3 throughout the surgery. We were able to calculate NIRS-derived autoregulation parameters in 103 patients (84%).

Conclusion(s): Both baseline MAP values analyzed in this study. $\mathsf{MAP}_{\mathsf{BASAL}\;\mathsf{HC3}}$ and $\mathsf{MAP}_{\mathsf{BASAL}\;\mathsf{PREOP}}$ overestimated the $\mathsf{MAP}_{\mathsf{OPT}}$ Nevertheless, both clinical approaches to arterial blood pressure management in neurosurgical procedures ensured that real intraoperative pressures were optimal for maintaining CA.

31AP05-6

Impact of ultrasound-guided superficial cervical plexus block on early postoperative recovery in patients undergoing microvascular decompression

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Background and Goal of Study: Cervical plexus block (CPB) has been reported to provide postoperative analgesia and reduce postoperative nausea and vomiting (PONV) following various head and neck surgical procedures. Effective postoperative pain control and reduced PONV are important in improving postoperative quality of recovery (QoR).

This randomized clinical trial investigated the impact of superficial CPB on early postoperative QoR in patients undergoing microvascular decompression (MVD).

Materials and Methods: Patients undergoing MVD for trigeminal neuralgia and hemifacial spasm treatment were randomly assigned to receive superficial CPB (n = 30) or not (n = 30). Superficial CPB was conducted using 10cc of 0.5% ropivacaine under ultrasound guidance at the lower midpoint of sternocleidomastoid muscle prior to the start of surgery.

The primary outcome was the QoR-15K score on postoperative

Secondary outcomes included QoR-15K scores measured preoperatively and on postoperative day 3, postoperative pain scores, incidence of rescue analgesic requirements, PONV, and perioperative inflammatory cytokine levels.

Results and Discussion: The QoR-15K score on postoperative day 1 did not show a significant difference (94.5 [68.0-116.0] vs. 80.5 [51.5-100.8], p = 0.077) between the CPB and control groups and preoperative QoR-15K scores showed no significant time × group effect (p = 0.324). Postoperative pain scores and the incidence of rescue analgesic requirements did not differ between the two groups. The CPB group experienced reduced frequency and severity PONV at postoperative hours 6 and 12, and less frequent PONV on day 1. Perioperative inflammatory cytokine levels showed no significant differences between the two groups.

Conclusion(s): Ultrasound-guided superficial CPB was found to reduce the incidence and severity of PONV in patients undergoing MVD during the early postoperative period; however, it did not lead to an improvement in early postoperative QoR.

References:

1. Kim JS, Ko JS, Bang S, Kim H, Lee SY. Cervical plexus block. Korean J Anesthesiol. Aug 2018;71(4):274-288. doi:10.4097/ kia.d.18.00143

2. Yao Y, Lin C, He Q, Gao H, Jin L, Zheng X. Ultrasound-guided bilateral superficial cervical plexus blocks enhance the quality of recovery in patients undergoing thyroid cancer surgery: A randomized controlled trial. J Clin Anesth. May 2020:61:109651. doi:10.1016/i.iclinane.2019.109651

Acknowledgements: Seoul National University Hospital

31AP05-7

Antiepileptic drugs for de-novo seizures prevention after craniotomy: a systematic review and network meta-analysis of current evidence

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Background and Goal of Study: Epileptic seizures constitute a well-recognized clinical entity in patients harboring a brain tumor. We aimed to systematically evaluate the available clinical evidence concerning comparable efficacy and safety of currently used anti-epileptic drugs (AEDs) for early or late de novo seizures prophylaxis in patients undergoing elective craniotomy for brain tumor excision and synthesize this with a network meta-analysis (NMA).

Materials and Methods: Current literature was scrutinized to identify all randomized controlled trials (RCTs) relevant to the prophylactic use of AEDs in patients subjected to brain tumor excision. Total, early, or late post-craniotomy seizures constituted primary outcome measures, while mortality and treatment-related adverse effects served as secondary endpoints. A pairwise metaanalysis of head-to-head comparisons between drugs within trials to obtain 'direct' treatment effect estimates, while the inconsistency between direct estimates and NMA was investigated via node splitting. The quality of the retrieved RCTs was assessed by the RoB2 tool, while the quality of evidence was tabulated using the CINeMA software.

Results and Discussion: Twelve RCTs involving 10 interventions applied either preoperatively or postoperatively were retrieved. Seven RCTs were rated as having "some concerns" and the remaining as "high risk" of bias. Only levetiracetam reduced the incidence of total [OR 0.15; 95%Cl 0.03-0.73; P-score 0.90] and early [OR 0.08; 95%CI 0.02-0.43; P-score 0.90] postoperative seizures compared with phenytoin, valproate, placebo, or no-treatment. Eight studies reported the impact of prophylactic use of AEDS on late seizures and failed to show any significant effect versus placebo or no treatment.

With the single exception of carbamazepine [OR 2.68; 95%CI 1.16-6.22; P-score 0.08], none of the implemented AEDs affected mortality versus placebo. Phenytoin [OR 4.68; 95%Cl 1.43-15.27; P-score 0.29] presented a higher incidence of treatment-related AEs imposing drug discontinuation compared to other treatment regimens.

Conclusion(s): Our NMA indicates that, in seizure-naive individuals subjected to craniotomy, levetiracetam effectively prevents postoperative total and short-term seizure activity. Moreover, levetiracetam presents an enhanced safety profile, vet no statistical superiority over other AEDs, placebo, or no-treatment could be demonstrated.

31AP05-8

Patient state index (PSI) changes in children with global developmental delay (GDD) during magnetic resonance imaging (MRI) procedure under dexmedetomidine sedation

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Background and Goal of Study: Dexmedetomidine is used to sedate children requiring MRI. GDD children have exaggerated reactions to small environmental changes. Whether their sedation requirements differ from other children is not known. In this prospective observational study during MRI, PSI changes following dexmedetomidine infusion in GDD children was compared with non-GDD ones.

Materials and Methods: Children with and without GDD, aged 1-16 years, seizure-free in the last month, and requiring sedation for MRI were recruited after parental consent and institute ethics committee approval. A PSI sensor (SedLine monitor, Masimo) was applied to the forehead. Dexmedetomidine 1mcg/kg bolus was given over a 10 min period and continued as 1mcg/kg/hr infusion during MRI. PSI values (average of three recordings) along with RSA scale were noted before infusion, at 5 and 10 minutes of infusion, at return from MRI and every 5 minutes until RSA scale reached 4. Airway complications, movement episodes during shifting and scanning and rescue drugs requirements were noted. The sample size was calculated to be 37 in each group.

Results and Discussion: The PSI values significantly decreased at the end of dexmedetomidine bolus infusion, but no differences between the groups (Table 1).

	GDD group	Non-GDD group	P value
Boys: girls	18:21	26:17	
Age months (median (IQR))	48 (24-84)	60 (48-108)	0.033*
Weight kg (median (IQR))	12(10-18)	16.5(12-23)	0.013*
MRI duration min (median (IQR))	47(40-60)	60(42-70)	0.026*
Baseline RSA scale (>4) %	67	34	0.03*
Cumulative dexmedetomidine dose (mcg)	22(15-32)	32(24-39)	0.001*
PSI at baseline	95(93-96)	94 (92-95)	0.125
PSI at 5min of dexmedetomidine infusion	88(74-94)	87(80-91)	0.576
PSI at 10 min of dexmedetomidine infusion	73(36-86)	47(31-80)	0.119

Table 1.

Movement episodes were similar during shifting (33.3%: non-GDD vs 39.5%: GDD, p=0.56). During scanning, 8 children in the GDD group and 9 children in the control group moved once. The median recovery time (to achieve RSA 4) were similar in both the groups (5min: GDD vs 10 min: non-GDD, p=0.699). No airway complications happened in either of the groups. Changes in RSA and PSI correlated significantly (r=0.7, p<0.001).

Dexmedetomidine acts subcortically resulting in similar PSA values in children with and without GDD. Airway-related adverse events were not seen as dexmedetomidine maintains airway patency compared to other sedatives.

Conclusion(s): PSI changes following dexmedetomidine in GDD children were not different from their peers and hence, dose adjustments might be unnecessary. PSI correlated significantly with the RSA scale.

Reference:

1. Todd J. et al., International Journal of Pediatrics Volume 2010;10.1155/2010/189142

31AP06-2

Opioid-free anesthesia for intracranial aneurysm clipping in opioid-dependent patient

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Background: Opioid-free anesthesia is gaining increasing popularity due to its advantages, in this case report we present an opioid-dependent patient whose surgery was performed without interrupting his anti-addiction therapy.

Case Report: The patient was a 52-year-old male with a history of hypertension and drug addiction (on methadone substitution therapy). The patient was admitted to the hospital due to a headache, selective angiography revealed an unruptured aneurysm of the right middle cerebral artery. Induction of anesthesia was performed with dexmedetomidine 1 µg/kg for 10 minutes followed by a loading dose of dexmedetomidine and propofol 2 mg/kg, followed by intubation.

Maintenance of anesthesia was with 0.7 MAC sevoflurane and 0.3/µg/kg/h dexmedetomidine. A unilateral scalp block with 0.5% ropivacaine was performed to anesthetize the surgical site.

The operation was performed without hemodynamic fluctuations. The depth of sedation was controlled by the BIS index (in the range of 35-45). The patient was extubated 30 minutes after surgery.

The immediate postoperative period was without any complications, patient was pain-free, without postoperative nausea and vomiting or episodes of hypertension. The patient did not receive any analgesics for the first 36 hours after the surgery and was discharged a few days later without complications.

Discussion: Pain management in patients undergoing opioid substitution therapy is guite challenging and can negatively impact their health, leading to higher rates of readmission, overdose, and relapse.

The primary reason for choosing dexmedetomidine in this context was to maintain relatively low blood pressure during and after surgery while achieving satisfactory anesthesia without relying on opioids. The surgery involved a regional block, and dexmedetomidine was particularly needed to manage pain associated with the dural incision. Anesthesia maintenance with low MAC (0.7) sevoflurane, allowed us to sedate the patient without increasing cerebral blood flow.

Learning Points: Postoperative pain and hypertension frequently occur after surgery, and elevated blood pressure can increase the risks of bleeding at the surgical site. Using opioid-free techniques can help reduce the chances of postoperative nausea and vomiting.

By adopting this approach, we lowered bleeding risks, improved patient satisfaction, and decreased the need for medications to manage hypertension and pain.

31AP06-5

India

Incidence, predictors and sequelae of extubation failure among neurosurgical patients requiring intensive care: a prospective observational study

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Background and Goal of Study: Extubation failure (EF) is an essential key performance indicator in the neurosurgical intensive care unit (NSICU). Its burden and influence on morbidity and mortality of neurosurgical patients remain to be elucidated in the context of Indian NSICUs. Hence, we aimed to evaluate the incidence, predictors and sequelae of EF among neurosurgical patients in our NSICU.

Materials and Methods: This prospective observational study was conducted from March 2023 to November 2024 after ethics approval at our tertiary care Neurosciences centre. We included all consenting neurosurgical patients admitted to the NSICU, excluding those with pre-existing tracheostomy and lack of consent.

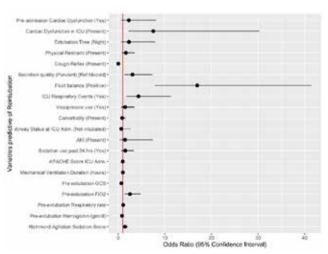


Image 1.

Sequelae	Effect	Effect (95% CL)	P-value
ICU_Tracheostomy	Odds Ratio	154.17 (55.26, 643.02)	<0.001
Post-extubation Pneumonia	Odds Ratio	73.13 (35.47, 171.67)	<0.001
In- Hospital Mortality	Odds Ratio	44.55 (12.92, 280.27)	<0.001
Length of hospital stay	Regression Coefficient	15.785 (10.98, 20.59)	<0.001
GCS at hospital discharge	Regression Coefficient	-2.552 (-2.97, -2.14)	< 0.001

Table 1: Seguelae of EF.

Results and Discussion: We screened 962 patients, of whom 396 were excluded as they did not undergo extubation (tracheostomised/died/discharged). The incidence of EF was 23.67% (134/566) among our recruited patients.

On univariate analysis, type of extubation, timing, restraint, cough/gag reflex, secretion quantity, fluid balance, ICU respiratory events, vasopressor and sedation use, cardiac dysfunction in ICU, pre-extubation FiO2, APACHE2 score, ventilation duration, GCS. RASS, haemoglobin and acute kidney injury were associated with EF.

On multivariate analysis, cardiac dysfunction in ICU (p = 0.001), positive fluid balance (p < 0.001), absent cough reflex (p < 0.001), respiratory events in ICU (p = 0.001), pre-extubation FiO2 (p = 0.003), pre-extubation haemoglobin (p = 0.035) and lighter sedation (p = 0.045) were predictors of EF (Image 1).

EF resulted in increased rates of tracheostomy, pneumonia, deaths, hospital stay and lower discharge GCS (Table 1).

Conclusion(s): The burden of EF is significant in the NSICU. Prediction using risk factors and timely restoration of modifiable variables are critical to prevent EF and its morbid and lethal sequelae.

31AP06-6

Efficacy of nalbuphine as an adjuvant to levobupivacaine scalp nerves block on postoperative analgesia in elective supratentorial craniotomy - a randomized double-blinded clinical trial

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Background and Goal of Study: The inadequate post-craniotomy pain can induce sympathetically mediated hypertension and tachycardia, which is related to morbidity and mortality. Scalp nerves block (SNB) has been shown to provide postoperative pain in early postoperative period. Nalbuphine was shown as an adjuvant to local anesthetics in various types of regional nerve blocks. The study was aimed to evaluate whether nalbuphine as an adjuvant to 0.25% levobupivacaine SNB can increase the duration of post craniotomy analgesia in elective supratentorial craniotomy.

Materials and Methods: The patients undergoing elective supratentorial craniotomy were prospectively, double-blinded randomized into two groups. After induction of anesthesia, SNB was done with 0.25% levobupiyacaine and 10 mg of nalbuphine in 1:200,000 adrenaline in the group NB, or with 0.25% levobupivacaine in 1:200,000 adrenaline in the group CB. The primary outcome was a postoperative opioid-free duration. The secondary outcomes were intraoperative mean arterial blood pressure (MAP), heart rate (HR), the total fentanyl consumptions, verbal numerical rating scale (NRS) and postoperative adverse events such as nausea, vomiting, and sedation during the first 24-hour. Post-operative analgesia was provided by patient-controlled analgesia (PCA) fentanyl. All data were collected for intention-to-treat

Results and Discussion: Sixty patients were recruited. The postoperative opioid-free duration was longer in group NB (360.03 \pm 114.93 mins) when compared to the group CB (342.4 \pm 109.12 mins) without statistical significance (p=0.545). Both intraoperative and the 24-hour postoperative fentanyl requirement were significantly lower in the group NB than the group CB (113.33 ± 50.07 mcg versus 136 \pm 34.65 mcg, p=0.047), (235.67 \pm 141 mcg versus 408.33 ± 211.62 mcg, p= 0.001) respectively. The averaged 24-hour NRS was significantly lower in the group NB (2.55 ± 1.95 versus 4.16 ± 1.8, p=0.002). MAP responses to pinning, incision and craniotomy compared with each patient at baseline was clinically greater in the group CB than the group NB. There was no difference in HR and the postoperative adverse events between

Conclusion(s): The addition of 10 mg of nalbuphine to 0.25% levobupivacaine for preoperative SNB did not prolong post-craniotomy opioid-free duration. However, nalbuphine can reduce intraoperative and 24-hour fentanyl consumption in elective supratentorial craniotomy patients.

31AP06-7

The potential of processed EEG monitoring systems in predicting postoperative cognitive disorders

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Background and Goal of Study: Postoperative neurocognitive disorders (PND), particularly postoperative delirium (POD), are a significant complication following surgery. It is especially prevalent among elderly patients, resulting in prolonged recovery and increased mortality [1].

This study aims to evaluate the efficacy of preoperative processed electroencephalogram (pEEG) indices to predict postoperative cognitive disorders.

Materials and Methods: 110 patients who underwent surgical intervention under general anesthesia were analyzed. Inclusion required intact preoperative EEG recordings (one minute eyesclosed and eyes-open) and cognitive assessments using the brief Confusion Assessment Method post-surgery. Processed EEG indices from three different systems (Bispectral Index (BIS), SEDLine Patient State Index (PSI), and Entropy Module's State Entropy (SE)) were analyzed. We used the Mann-Whitney U test for comparisons. Discriminatory ability was evaluated via Area Under the Curve.

Results and Discussion: Out of 80 patients (30 had to be excluded due to corrupted baseline data), 30 % showed signs of postoperative delirium. Analyses revealed significant differences in pEEG values between patients with and without delirium, particularly during the eyes-closed state. All monitor indices showed (significant but weak) predictive capability for postoperative cognitive deficits (BIS (p=0.04; AUC: 0.65 [0.51; 0.78]), PSI (p=0.05; AUC: 0.64 [0.51; 0.77]), SE (p=0.04; 0.64 [0.51; 0.76]) and RE (p=0.05: AUC:0.64 [0.51: 0.76], except BIS-SEF (p=0.09; AUC: 0.62 [0.49; 0.75].

Conclusion(s): This study highlights the potential of preoperative pEEG monitoring to identify patients at risk for postoperative delirium, particularly given the growing elderly surgical population. Results indicate that lower baseline values seem to correlate with increased risk for delirium. Its integration into preoperative assessments may enhance patient care and lower PND risks. Future work is essential to validate these findings across larger, diverse populations and to elucidate the mechanisms connecting pEEG patterns with postoperative cognitive outcomes.

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31AP06-8

Recurrent extubation failures in a patient with intracranial hemorrhage post surgery

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Background: Prolonged invasive ventilation is common post intracranial hemorrhage. Extubation is complex because both failure and delay increase morbidity and mortality1. Yet, there is no widely validated consensus regarding optimal timing and management. We describe a case of recurrent extubation failures in a patient with intracranial hemorrhage, to highlight key points of

Case Report: A 59 year old male presented with acute intracranial hemorrhage in the left cerebellar hemisphere measuring 3.9 x 2.7x 3.3 cm. He had a posterior fossa decompression, evacuation and insertion of external ventricular drain and was kept intubated. Post-operative scans showed a smaller residual hematoma. His GCS improved to E4VTM6, thus decision was made to extubate early after successful spontaneous breathing trials.

However extubation on post operative day (POD) 3 and 6 were unsuccessful as he went into profound bradycardia with asystole collapses, likely baroreceptor-mediated by the cerebellar hemorrhage affecting the medulla. Transvenous pacing wire was then placed for peri-extubation support. Extubation was also delayed until the edema has improved. Extubation was attempted again on POD19. However, he needed re-intubation due to Type 2 Respiratory Failure. Eventually, he was successfully extubated to BiPAP on POD22.

Of note, he required BiPAP throughout the day. He was diagnosed to have central sleep apnea superimposed on obstructive sleep apnea, attributed by his cerebellar hemorrhage. He was later discharged with nocturnal BiPAP.

Discussion: Stroke can cause cardiovascular autonomic dysfunction, causing cardiac arrhythmias. It may be prudent to delay extubation to mitigate the baroreceptor mediated effects. Mixed apneas can be prevalent post stroke, potentially manifesting as respiratory compromise before overt respiratory failure. Non-invasive ventilation should be considered for preventing post-extubation respiratory failure. References:

Reference:

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Learning Points: Classical respiratory weaning parameters may not reliably predict extubation success in stroke patients. Understanding the cardiovascular and respiratory pathophysiology in stroke patients will help guide clinical management. Heightened vigilance should be exercised when extubating.

The role of neuromonitoring in catastrophic iatrogenic subarachnoid hemorrhage complication during mechanical thrombectomy

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Background: Mechanical thrombectomy is an option to restore circulation in patients with basilar artery occlusion, which is a rare condition that affects the lower brainstem circulation, potentially leading to severe complications. Monitoring the depth of anesthesia and cerebral activity is particularly important, as it can provide real-time insights of cerebral function to guide clinical decisions (1).

Case Report: An 83-year-old woman, with chronic hypertension and dyslipidemia, was admitted to the angiography suite of a tertiary hospital for mechanical thrombectomy, due to a basilar artery stroke. At admission she was intubated, under mechanical ventilation, hypertensive, with new onset atrial fibrillation, and had mild anisocoria (right > left). The mechanical thrombectomy was performed under general intravenous anesthesia. Standard ASA monitoring, depth of anesthesia monitoring and cerebral oximetry were used.

After 90 min, an iatrogenic rupture of the basilar artery occurred during the thrombectomy, resulting in massive subarachnoid hemorrhage, simultaneously with a drop in BIS (from 45 to 0), an isoelectric EEG wave, and fixed mydriasis. Given the futility of attempts at hemostasis, care was shifted to comfort measures.

Discussion:In the setting of catastrophic cerebral hemorrhage, such as the basilar artery rupture, the BIS showed a dramatic decline in cortical electrical activity, correlating with the clinical progression toward brain death.

The sudden drop in BIS, the appearance of an isoelectric wave in the raw EEG and a flatlined spectrogram was consistent with the clinical picture of fixed mydriasis, loss of neurologic reflexes, and hemodynamic instability, reinforcing the diagnosis of irreversible brain injury.

Using BIS monitoring in this case made it possible to track brain activity in real time and offered clear data to guide the decision to focus on comfort care. This highlights how useful BIS can be in critical care and neurosurgery, especially for understanding the effects of severe neurological events.

References:

Patrick L. Purdon, Aaron Sampson, Kara J. Pavone, Emery N. Brown; Clinical Electroencephalography for Anesthesiologists: Part I: Background and Basic Signatures. Anesthesiology 2015; 123:937-960 doi: https://doi.org/10.1097/ ALN.0000000000000841

Learning points: BIS is an important instrument used to assess the level of anesthesia and brain activity during the perioperative setting and in critical care context.

31AP07-3

Basal sleep differences correlate with anxious phenotypes in mice: establishing a valid animal model for post-anesthetic cognitive impairments

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Background and Goal of Study: Postoperative delirium (POD), ranging from mild cognitive impairments to chronic deficits or death, is relevant in up to 80% of patients after surgery under general anesthesia (GA). The systemic-mechanistic relationship between clinically relevant preoperative anxiety (POA) and POD, though frequently reported, remains largely unknown.

Identifying a preoperative-anxious phenotype and associated sleep impairments holds potential to establish predictive parameters for POD. These discoveries may further elucidate the neuronal mechanisms underlying these phenomena.

Materials and Methods: 50 C57BL/6N male mice (16 weeks old) were used. Chronic EEG and EMG recordings assessed basal sleep/wake behavior, followed by cued fear-conditioning (FC, 120s acc., 30s auditory stimulus (10kHz, 75dB/octave), 2s with 0.6mA foot-shock, repetition-rate=5) and fear retrieval after 24h

Anxiety phenotypes were classified into low anxiety (LA) and high anxiety (HA) groups using k-medoids clustering based on six freezing behavior measures obtained from FC and RET.

Results and Discussion: LA and HA mouse phenotypes were classified with a median silhouette score of 0.333. HA mice exhibited a unique sleep behavior at baseline before FC, including reduced REMS during light phase (p=0.004, AUC=0.742). decreased WAKE during dark phase (p=0.024, AUC=0.688), and shorter REMS bout lengths during dark phase (p=0.034, AUC=0.678).

Further, HA mice showed unique sleep spindle (SP) characteristics with shorter median SP duration (p=0.009, AUC=0.283) and lower normalized SP amplitude (p=0.018, AUC=0.303) during the dark phase.

Spectral analysis revealed that HA mice had reduced low-delta power (0.1-2.5Hz) during NREMS throughout 24h (AUC=0.730) and increased high-frequency power (15-30Hz) during REMS in both phases (AUC=0.281), compared to LA at baseline.

Our results showcase the classification of naive animals into LA and HA mice using only prognostic EEG parameters and establish an animal model for POA, based on their intrinsic predisposition to individual anxiety levels.

Conclusion(s): We are currently testing potential cognitive impairments in HA and LA animals after experimental GA exposure in the Water-Cross-Maze test, thereby extending our POA model to a POA/POD model.

This model will allow us to investigate GA-dependent physiological processes and morphological conditions systemically in vivo, that potentially lead to postoperative cognitive impairments.

Determinants of functional prognosis at 3-months in patients with acute ischemic stroke following successful mechanical thrombectomy under general anaesthesia

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Background and Goal of Study: Acute ischemic stroke (AIS) occurs due to an obstruction in cerebral blood flow. This leads to rapid loss functional brain tissue and neurological deficits. Mechanical thombectomy has become the treatment of choice. restoring blood flow effectively, particulary under general anaesthesia (GA), which improves reperfusion rates and functional outcomes. However, even after successful intervention, long-term functional outcomes vary significantly based on demographic, clinical and in-hospital factors.

This study analyses predictors of functional independence (modified Rankin Scale [mRS]) at three months following mechanical thrombectomy performed under GA.

Materials and Methods: A retrospective study was conducted at a tertiary hospital (University Hospital Complex of Santiago de Compostela) between January 2021 and March 2023. Adult patients with AIS who underwent endovascular treatment under GA, with anterior circulation involvement, a baseline mRS score ≤2 and a satisfactory angiographic outcome (TICI 2b-2c-3) were included. Patients were followed for three months post-procedure. A descriptive analysis was performed to evaluate the patients' characteristics and clinical factors. A binomial logistic regression model was developed to identify factors associated with an unfavourable functional outcome (mRS >2).

Results and Discussion: A total of 254 patients with AIS underwent endovascular treatment and were admitted to the intensive care unit (ICU) of our hospital. Of these, 74 patients were excluded for not meeting the inclusion criteria. Functional prognosis, assessed using the modified Rankin Scale (mRS) at three months, showed that 92 patients (49,5%) had an unfavourable functional outcome (mRS >2).

Factors associated with poor outcomes included advanced age (mean 81 years), hypertension (80, 4%) high NIHSS on admission (median 17), proximal vessel involvement (internal carotid artery and middle cerebral artery-M1, in-hospital infections (50% of cases) and prolonged mechanical ventilation (> 12h, p < 0.05).

Multivariate analysis identified advanced age (OR = 1.07, p < 0.001), high NIHSS on admission (OR = 1.09, p = 0.015) and inhospital infections (OR = 2.62, p = 0.012) as independent predictors of poor outcomes.

Conclusion(s): In patients with AIS treated with successful mechanical thrombectomy under GA, the most relevant predictors of unfavourable functional prognosis at three months (mRS >2) include advanced age, greater NIHSS and mRS scores at admission, proximal vessel involvement (ICA and MCA-M1), in-hospital infections and prolonged mechanical ventilation (>12h).

These findings highlight the importance of a thorough risk assessment and proactive measures to optimise perioperative management and improve long-term functional outcomes.

31AP07-8

"Sex-specific" influences after combined ASDH and hemorrhagic shock in a long-term, resuscitated porcine model

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Background and Goal of Study: Outcome after polytrauma depends on the presence of traumatic brain injury (TBI) and hemorrhagic shock (HS). Equivocal data is available on the impact of sex. Therefore, we compared female and male swine undergoing combined acute subdural hematoma (ASDH) and HS.

Materials and Methods: Up to now, this prospective, randomized investigation comprised young adult (age 20-24 weeks) females (n=18) and non-castrated males (n=18) of comparable body weight. After induction of anesthesia, mechanical ventilation and neurosurgical instrumentation (bi-hemispheric multimodal monitoring for intracranial pressure, brain tissue temperature, O2 partial pressure, and microdialysis for glucose, lactate, pyruvate, glutamate), animals underwent combined ASDH (injection of 0.1 mL/ kg autologous blood into the subdural space) and HS (removal of 30% of the calculated blood volume while maintaining cerebral perfusion pressure (CPP)>55 mmHg).

At 2 hours of ASDH and HS, TBI-guided ICU care (maximum of 48 hours) was started (re-transfusion of shed blood, noradrenaline infusion to maintain CPP>70mmHg, and maintenance of normothermia).

Systemic and cerebral hemodynamics, gas exchange and metabolism were determined together with intermittent recording of a "Modified Veterinary Glasgow Coma Scale" (MGCS). Statistical evaluation was performed using non-parametric rank sum tests as appropriate.

Results and Discussion: Metabolism did not exhibit any significant inter-group differences at any time point, indicating the absence of pre-experimental differences between the groups and suggesting that the severity of the shock was comparable across all groups.

While the amount of removed blood volume during HS was comparable across the groups, the male animals tended to require more catecholamine support than the female animals. Survival did not significantly differ. The MGCS in females did not deteriorate between baseline and 48 hours of ICU care, whereas in males it decreased significantly.

Conclusion(s): Results from this long-term, resuscitated porcine model of ASDH and HS suggest that sex affects outcome after ASDH and HS.

i. Both sexes exhibited comparable survival times, however; ii. males had impaired neurological and motor function.

Acknowledgements: Supported by the Deutsche Forschungsgemeinschaft (DFG), project number 251293561

Research on the Role of Histone Deacetylase 2 (HDAC2) in sevoflurane-induced cognitive impairment in the hippocampus of aging model

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Background: The global aging population has led to an increase in surgeries requiring anesthesia in elderly patients, with sevoflurane being a commonly used inhaled anesthetic in this demographic. Emerging evidence suggests that sevoflurane anesthesia may contribute to postoperative cognitive decline, especially in the elderly. Age-related alterations in synaptic plasticity-related proteins within the hippocampus are key contributors to this impairment. Histone deacetylases (HDACs), including HDAC2, are critical regulators of cognitive function through their influence on the expression of synaptic plasticity-related proteins. However, the specific role of HDAC2 in sevoflurane-induced cognitive dysfunction remains unclear.

Methods: Aging Model Development: Aging model mice were established by subcutaneous injection of D-galactose (120 mg/kg/ day) for 42 days. Spatial learning and memory were assessed using the Y-maze and Morris water maze, and hippocampal HDAC2 expression was measured via Western blot analysis. Aging model mice were further divided into five groups (n=12 each): aging model group, aging model + sevoflurane group, blank virus group, HDAC2 knockdown group, and HDAC2 knockdown + sevoflurane group. AAV-mediated HDAC2 knockdown was achieved via hippocampal microinjection.

Mice were exposed to carrier gas (1L/min O2 + 1L/min air) or 3.4% sevoflurane mixed with carrier gas for 4 hours daily over three consecutive days. Spatial learning and memory were evaluated using the same behavioral tests, and hippocampal protein levels (HDAC2, ac-H3K9, ac-H4K12, BDNF, and PSD95) were analyzed using Western blot.

Results: 1. HDAC2 knockdown in aging model mice significantly improved cognitive performance in both behavioral tests (P < 0.01), decreased hippocampal HDAC2 expression (P < 0.01), and increased levels of ac-H3K9, ac-H4K12, BDNF, and PSD95 (P < 0.01).

Following repeated sevoflurane exposure, HDAC2 knockdown mitigated cognitive impairments and associated protein changes compared to non-knockdown aging model mice (P < 0.01). However, no significant differences were observed in the magnitude of these changes between HDAC2 knockdown mice with and without sevoflurane exposure.

Conclusions: Hippocampal HDAC2 knockdown attenuates sevoflurane-induced cognitive dysfunction by modulating histone acetylation and synaptic plasticity-related proteins, suggesting that HDAC2 may underlie the increased vulnerability of aging brains to sevoflurane.

31AP07-10

Frontal alpha oscillations as a marker for anaesthesia quality - towards a systematic review with narrative synthesis

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Background: There is a growing interest in alpha oscillatory activity during intraoperative EEG analysis, yet a lack of a unified approach has led to significant heterogeneity across studies. This systematic review aims to summarise the current literature and highlight the clinical relevance of frontal alpha and its associated correlates in the context of general anaesthesia.

Methods: We searched Ovid MEDLINE, Embase, Cochrane CEN-TRAL, and Web of Science from 1990 to October 2023. Inclusion criteria were human patients (age ≥18 years) undergoing any kind of surgery (except brain surgery) under general anaesthesia, with EEG monitoring frontal alpha activity. Studies using non-GABAergic hypnotics were excluded.

No restrictions concerning outcomes or observations were made. Independent reviewers screened titles, abstracts, and full texts against eligibility criteria and performed data extractions.

We used RoB 2 and ROBINS-I for risk of bias and GRADE for quality pilot assessments. We opted for a narrative synthesis instead of meta-analysing effect sizes due to the high heterogeneity of the included studies.

Results: Out of 1879 screened articles, 61 met eligibility criteria, while 52 are subject to further evaluation. Included studies were heterogenous, and methodological quality varied. Sample sizes ranged from 10 to 1002 patients, with female proportions from 0 to 100%, and widely varying age ranges. EEG monitoring techniques differed between studies, e.g. single or bipolar electrodes, EEG caps, etc. No uniform definition for alpha (Hz) was identified. The lowest reported limit for the alpha band was 6 Hz and the highest 17 Hz, with 8-12 Hz being the most reported range (n=19 studies).

Various EEG analysis methods were described. Changes in alpha activity were most linked to anaesthetic regimen (n=22), age (n=11), and postoperative neurocognitive outcome (n=7). Findings may evolve as further data are included.

Conclusion: Alpha dynamics are very complex, and various mechanisms are involved in the changes of alpha appearance, power, or patterns.

Understanding these mechanisms is crucial to avoid attributing importance to them, simply because significant confounding factors have been overlooked. With our ongoing analyses and preliminary findings, we can emphasise the high heterogeneity of approaches and results.

By highlighting these issues, we hope to contribute to more standardised approaches investigating anaesthetic-induced alpha oscillatory activity.

Cognitive, psycho-emotional and genetic testing patients with pathological tortuosity of the internal carotid arteries

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Goal of Study: To identify surgical alternatives before treatment (neurological, cognitive, emotional and genetic testing), deficits in the postoperative periods (stroke, delirium, cognitive disorders) and to improve neurological and cognitive results of treatment in patients with Pathological tortuosity of the internal carotid arteries (PT ICA).

Materials and Methods: A total of 40 patients were analyzed and divided into 2 groups depending on the treatment tactics - surgical treatment (23) and conservative observation (17). The operation is most often aimed at immediate complete resection of the pathological fragment of the ICA. All patients underwent cognitive function testing (MOCa), the anxiety and depression testing (HADS), Delirium testing (RASS, CAM or ICDSC) and genetic testing.

Results and Discussion: The embolization was observed more often in patients with septal ICA PTs (21,7%). The Short-term, as well as the Long-term mental disorders were correlated with episodes of preoperative baseline presence of mild cognitive impairment, intraoperative microembolisation, episodes of decreased cerebral perfusion and postoperative delirium. Proven genetic syndrome - the Heritable connective tissue disorders (HCTD), including Marfan syndrome, was found in 7 cases (17.5%).

	Group 1 (23 patients)	Group 2 (17 patients)
Sex (M–F)	56,5% - 43,5%	11,8% - 88,2%
Side (R-L-Bilateral)	30,4%- 39,1% - 30,4%	11,8% - 0 - 88,2%
Septal stenosis	21,7%	0
Atherosclerotic	13,0%	23,5%
Cerebro-vascular insufficiency		
Asymptomatic	17,4%	17,6%
Discirculatory encephalopathy	65,2%	64,7%
Transitory ischemic attack	8,7%	5,9%
History of stroke	8,7%	11,8%



Conclusion: The intellectual sphere of patients depends on the competent management of the postoperative period in the intensive care unit. The main attention should be paid to the early detection of the patient's neurological impairment and diagnostic of delirium, including subsyndromal form.

We also came to the conclusion that in the presence of septal tortuosity, microembolization occurs in the territory of the ipsilateral Middle cerebral artery, which subsequently leads to multiple brain lesions. Identifying a genetic syndrome is important for prognostic purposes.

31AP07-12

Enhancing postoperative pain management in spine surgery: Intraoperative ketamine infusion and continuous erector spinae block

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Background and Goal of Study: Effective postoperative pain control in spine surgery is crucial for patient recovery, reducing opioid consumption and minimizing complications. Many patients experience significant pain after spine procedures. This study investigates the combined use of intraoperative ketamine infusion and postoperative continuous erector spine block (ESP).

Materials and Methods: A prospective, observational study was conducted on adult patients undergoing elective spinal fusion of 3-5 levels. Exclusion criteria were the presence of dementia, malignancy and CNS infection. 53 patients were divided to two groups: group A received intraoperative ketamine infusion along-side continuous postoperative ESP block, while group B received standard multimodal analgesia as shown in Table 1.

	INDUCTION	MAINTENANCE	NERVE BLOCK	INTRA- OPERATIVE	POST- OPERATIVE
GROUP A (n=26)	TIVA-TCI (propofol- remifentanil), PSI target <30 fentanyl 100mcg IV, rocuronium 0,6mg/kg IV	TIVA-TCI (propofol- remifentanil), PSI target 30-40	Bilateral ESP block (20ml + 20ml ropivacaine 0,375%) at end of surgery and continuous post- op infusion (3ml/h ropivacaine 0,2%)	Paracetamol 2gr, ketamine 0,3mg/ kg bolus (10min IV infusion before incision) followed by 0,1mg/ kg/h infusion, morphine 0,05-0,1 mg/kg, Mg2SO4 2gr	Paracetamol 1grX3, ondansetron 4mgX2, PCA morphine regiment (1mg bolus, 10min lockout, 4mg hourly limit)
GROUP B (n=27)	TIVA-TCI (propofol- remifentanil), PSI target <30 fentanyl 100mcg IV, rocuronium 0,6mg/kg IV	TIVA-TCI (propofol- remifentanil), PSI target 30-40	-	Paracetamol 2gr, morphine 0,1-0,2 mg/kg, wound infiltration with ropivacaine 0,2%, Mg2SO4 2gr	Paracetamol 1grX3, ondansetron 4mgX2, PCA morphine regiment (1mg bolus, 10min lockout, 4mg hourly limit)

Table 1. Anesthetic techniques used.

Pain scores (NRS), opioid consumption, incidence of postoperative nausea and vomiting (PONV), and length of hospital stay were assessed at multiple time points postoperatively (0, 6, 12, 24, 48 hours).

Additionally, the incidence of complications such as catheter displacement, infection and neurologic determent were monitored. We gathered data from patient anesthesia forms and patient interview. We analyzed data with IBM SPSS software. T-test was used.

Results and Discussion: Group A experienced lower pain scores at 6, 12, 24 and 48 hours postoperatively compared to group B. Opioid consumption was reduced by an average of 40% in the ketamine-ESP block group. There was no significant difference in the incidence of PONV or length of hospital stay between the two groups. No complications related to the nerve block catheters or ketamine infusion were observed.

Post-operative pain levels						
	NRS MEAN at 0h	NRS MEAN at 6h	NRS MEAN at 12h	NRS MEAN at 24h	NRS MEAN at 48h	
GROUP A (n=26)	1	1	2	2	2	
GROUP B (n=27)	1	3	3	4	4	

Conclusion(s): The combination of intraoperative ketamine infusion and continuous postoperative ESP block appears to offer a promising approach for enhancing postoperative pain management in spine surgery. This regimen effectively reduces postoperative opioid use, provides sustained pain relief and is welltolerated, with minimal complications.

Heart: Cardiovascular Anaesthesiology and Haemodynamics

32AP01-1

Predictive factors for postoperative vasopressor use: a monocentric observational study

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Background and Goal of Study: Postoperative hypotension is a common event after major non-cardiac surgery, often requiring intravenous vasopressor infusion. Postoperative hypotension could be a modifiable risk factor for postoperative complications. The aim was to determine the incidence and risk factors associated with the use of vasopressors postoperatively in digestive and gynecologic cancer surgery.

Materials and Methods: This was a prospective, descriptive, and analytical monocentric observational study conducted at the National Institute of Oncology (INO) - Mohamed Ben Abdellah Hospital, CHU Ibn Sina, Rabat. The studied event was defined as postoperative vasopressor infusion, which is the continuous intravenous infusion of a drug with a predominant vasoconstrictif effect. Patients receiving postoperative vasopressors were classified in the VASO group.

The primary endpoints were to determine the proportion of patients receiving vasopressors postoperatively, the incidence of organ dysfunctions, and to identify factors affecting care (patient, condition, surgery, and perioperative management) associated with postoperative vasopressor infusion.

Results and Discussion: A total of 90 patients were recruited for our cohort study. Comparative analysis of demographic and preoperative clinical data revealed no statistically significant difference between the control and VASO groups. Some variables showed a statistically significant difference between the two groups, for example : supra-mesocolic surgery vs. other types (p = 0.035); low systolic pressures during the perioperative period (p < 0.001); hemorrhage vs. resection surgery (p = 0.001).

Postoperative hypotension is a frequent complication after major non-cardiac surgery. It is often due to a combination of reduced preload (typically caused by relative hypovolemia, possibly from bleeding or fluid redistribution) or reduced afterload. Less commonly, there may be impaired cardiac contractility, we identified patient profiles at higher risk of postoperative hypotension, which may pave the way for randomized clinical trials to test specific interventions.

The incidence of postoperative vasopressor treatment has never been specifically described.

Conclusion(s): Our study was conducted to better understand the criteria and factors that influence the decision to administer vasopressors after surgery, particularly in maintaining normal blood pressure in patients with postoperative hypotension.

32AP01-2

Endothelial dysfunction as a predictor of perioperative myocardial injury: the use of flow-mediated dilation as a discriminative tool

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Background and Goal of Study: Perioperative myocardial injury (PMI) indicates myocardial damage and is associated with major adverse cardiovascular events (MACE). Endothelial dysfunction (ED) also correlates with MACE. Flow-mediated dilation (FMD) is a non-invasive method for assessing ED. If patients with ED are at higher risk of myocardial injury, FMD could identify those at risk of PMI. We aim to assess FMD's ability to predict PMI.

Materials and Methods: A nested analysis of the FONIS SA22I0146 project, a prospective observational study approved by the Ethics Committee of the Clinical Hospital of the University of Chile (Ref: OAIC 1316/22, NCT05778981). The study aims to define the incidence of myocardial injury in non-cardiac surgery and evaluate the predictive value of FMD. Here, we analyzed 100 patients undergoing intermediate- and high-risk elective surgery. High-sensitivity Troponin I (hs-Tnl, Ortho-Vitros, 99th percentile - 11 ng/mL) was measured preoperatively and at 24-, 48-, and 72-hours post-surgery. FMD was assessed preoperatively using brachial artery ultrasound, with images acquired at baseline and at 15, 30, 60, 90, and 120 seconds post-reperfusion, following a standardized 4-minute ischemic period. FMD was defined as the maximum dilation relative to baseline, while Delta FMD was the difference between maximum and minimum dilation. Thresholds of 10% and 15% were used for ED evaluation. PMI incidence was reported as a relative frequency. Daily hs-Tnl changes were analyzed, and the area under the curve (AUC, SD) of hs-Tnl concentration over time was compared between FMD thresholds (Student's t-test). ROC curves were constructed to assess the association between FMD and Delta FMD with PMI.

Results and Discussion: Hs-Tnl levels above 11 ng/mL were observed in 42% of patients, with 6% exceeding 60 ng/mL. No 30day mortality occurred. Using an Delta FMD threshold of 15%, differences in hs-Tnl concentrations over time were observed (AUC 21.76, SD 12.22 in the non-ED group vs. 30.71, SD 17.3 in the ED group, p=0.0014). ROC curves showed FMD had an AUC of 0.52 (95% CI: 0.40-0.64) for detecting elevations at 11 ng/mL and an AUC of 0.59 (95% CI: 0.36-0.83) for 60 ng/mL. Delta FMD had an AUC of 0.53 (95% CI: 0.41-0.65) at 11 ng/mL and 0.72 (95% CI: 0.55-0.88) at 60 ng/mL.

Conclusion(s): Flow-mediated dilation evaluation can predict the development of PMI. Endothelial function may guide risk stratification in patients undergoing non-cardiac surgery.

32AP01-3

Effects of cipepofol versus propofol on hemodynamics after induction in aortic stenosis patients: a randomized clinical trial

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Background and Goal of Study: Postinduction hemodynamic instability is a common complication in patients with severe aortic stenosis (AS). Cipepofol, a propofol analog, may reduce the incidence and severity of this instability.

The aim of this study was to assess whether cipepofol outperforms propofol in maintaining postinduction hemodynamic stability in patients with AS. We hypothesized that cipepofol would better mitigate the risk of postinduction hemodynamic instability compared to propofol.

Materials and Methods: A single-center, randomized controlled trial was conducted at the Second Affiliated Hospital of Zhejiang University School of Medicine, China, from June 29, 2023, to July 8, 2024. A total of 169 patients with AS scheduled for transcatheter aortic valve replacement (TAVR) were initially screened.

After exclusions, 124 patients were randomized in a 1:1 ratio to receive either cipepofol or propofol as anesthesia agents. Due to subsequent ineligibility, data from 122 patients (61 per group) were analyzed based on the intention-to-treat principle.

The primary outcome was the area under the curve (AUC) of the mean arterial pressure (MAP) difference from baseline within the first 15 minutes post-induction. The Wilcoxon rank-sum test was used to compare the AUC between the two groups.

Results and Discussion: Compared with the propofol group, the cipepofol group exhibited a significantly smaller AUC (median [IQR]: -8,505.0 [-12,402.8, -5,130.0] mm Hg·s vs. -13,189.0 [-17,006.7, -7,593.3] mm Hg·s; P < 0.001).

Moreover, compared with the propofol group, the cipepofol group demonstrated a significantly lower incidence of postinduction hypotension (PIH) (70.5% vs. 88.5%, P = 0.014) and required less norepinephrine during the first 15 minutes postinduction (median [IQR]: 6.0 μ g [0.0, 10.0] vs. 10.0 μ g [5.0, 20.0], P = 0.006). Subgroup analyses further confirmed that cipepofol provided better hemodynamic stability in high-risk patients.

These findings indicate that cipepofol offers superior hemodynamic stability during anesthesia induction in TAVR patients, with no compromise in anesthesia depth, as demonstrated by the similar BIS values between groups.

Conclusion(s): As an induction agent, cipepofol provides superior hemodynamic stability over propofol at comparable anesthesia depths for patients with AS. Cipepofol could therefore serve as alternative induction agent to propofol for patients with high cardiovascular risk.

32AP01-5

Diastolic dysfunction as a contraindication for robotic gynecologic surgery?

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Background: Trendelenburg positioning and pneumoperitoneum during robotic-assisted laparoscopy induce physiological changes, including increased mean arterial pressure, peripheral vascular resistance, and myocardial oxygen consumption, reduced pulmonary functional capacity and enhanced pulmonary congestion.^{1,2} These changes pose significant risk for patients with cardiopulmonary pathology.

While robotic surgery lacks absolute contraindications^{1,2}, diastolic disfunction is not listed among relative cardiopulmonary contraindications.2

Case Report: A 73-year-old female with controlled hypertension was scheduled for robotic-assisted total hysterectomy and bilateral adnexectomy for endometrial cancer. Preoperative evaluations were normal, but the patient reported fatigue with a functional capacity of 3 METs.

Echocardiography revealed left atrial dilation without systolic dysfunction. After positioning and initiating pneumoperitoneum, the patient experienced sustained hypertension (maximum 290/217 mmHg) despite antihypertensive therapy, leading to procedure suspension.

Reversing positioning and pneumoperitoneum resulted in hypotension (54/43 mmHg), hypoxemia (SpO₂ 85%), and hypocapnia (EtCO₂ 21 mmHg), with pulmonary crackles and secretions.

Acute pulmonary edema was diagnosed and managed with vasopressors, diuretics and increased PEEP, restoring stability. Postoperative echocardiography revealed significant diastolic dysfunction.

Discussion: This case highlights hypertensive acute pulmonary edema in a patient with controlled hypertension and fatigue. Chronic hypertension and left atrial dilation, often overlooked, may predispose patients to diastolic dysfunction and heart failure. Symptoms like fatigue and reduced functional capacity (<4 METs) suggest latent cardiopulmonary pathology.

Detailed preoperative evaluation and risk stratification are critical, especially for hypertensive patients undergoing robotic-assisted laparoscopy.

References:

- 1. Suryawanshi C, Shah B, Khanna S, Ghodki P, Bhati K, Ashok K. Anaesthetic management of robot-Assisted laparoscopic surgery. Indian J Anaesth. 2023;67(1):117-122.
- 2. Tameze Y, Low YH. Outpatient Robotic surgery: Considerations for the Anesthesiologist. Adv Anesth. 2022;40(1):15-32.

Learning Points: Robotic surgery introduces significant hemodynamic and ventilatory challenges. Chronic hypertension associated to left atrial dilation and fatigue may indicate underlying cardiopulmonary compromise, as diastolic dysfunction.

32AP01-6

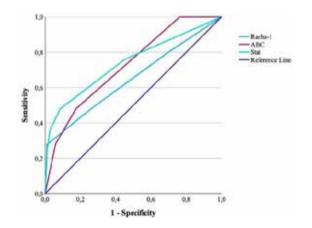
Comparison of risk scoring systems in pediatric patients undergoing congenital heart surgery

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Background and Goal of Study: This study assessed the predictive accuracy of STAT, RACHS-1, and ABCS scoring systems for in-hospital mortality and clinical outcomes in pediatric congenital heart surgery to improve perioperative care (1,3).

Materials and Methods: A retrospective analysis of 321 pediatric patients treated at Ege University Medical Faculty (2018–2020) was conducted. Ethical approval was obtained. Demographic and surgical data, risk scores, and perioperative parameters like cardiopulmonary bypass (CPB) time and complications were analyzed using statistical methods including Mann-Whitney U tests. Kruskal-Wallis H tests, and ROC curve analyses.

Results and Discussions: Of the patients, 54.8% were female, and 45.2% male, with a median age of 24 months. Preoperative needs included ICU admission (6.5%) and mechanical ventilation (4%). Postoperatively, 80.1% required inotropic support, 20.2% had complications, and 7.8% mortality occurred. STAT scores showed strong correlations with mortality (p<0.05), while RA-CHS-1 effectively predicted outcomes in younger patients. ABCS scores provided insights into complexity but were less predictive for complications (1,2).



Conclusions: STAT, RACHS-1, and ABCS scoring systems are valuable tools for risk stratification in pediatric congenital heart surgery. Multidisciplinary planning and advanced predictive models can further optimize care and outcomes (3).

References:

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- 2. Al-Radi OO, Harrell FE, Caldarone CA, McCrindle BW, Jacobs JP, Williams MG, vd. Case complexity scores in congenital heart surgery: a comparative study of the Aristotle Basic Complexity score and the Risk Adjustment in Congenital Heart Surgery (RACHS-1) system. J Thorac Cardiovasc Surg. April 2007;133(4):865-75.
- 3. O'Brien SM, Clarke DR, Jacobs JP, Jacobs ML, Lacour-Gayet FG, Pizarro C, vd. An empirically based tool for analyzing mortality associated with congenital heart surgery. J Thorac Cardiovasc Surg. 01 November 2009;138(5):1139-53.

32AP01-7

A rare case of transprosthetic cuff leakage after aortic valve replacement

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Background: Peri- and trans-valvular leakage can occasionally occur following artificial valve replacement. Anesthesiologists must differentiate between various types of leakage and assess its severity during surgery, particularly through transesophageal echocardiography (TEE). In such cases, there is a possibility of atypical valve leakage.

Case report: A 78-year-old male presented with recurrent syncope over the past two months. Cardiac echocardiography revealed severe aortic stenosis, and the patient was scheduled for a bioprosthetic valve (PERIMOUNT Magna) aortic bioprosthetic valve. replacement. During weaning from cardiopulmonary bypass (CPB), transesophageal echocardiography (TEE) revealed a transvalvular leakage at the stent post, although the degree of leakage was mild.

Based on the findings, we diagnosed the leakage as transprosthetic cuff leakage (a form of non-peri, non-trans-valvular leakage), which resolved after the administration of protamine.

Discussion: Although recent advances in valve replacement techniques have been made, paravalvular leaks remain a life-threatening complication in patients with prosthetic heart valves. While these defects may sometimes have little clinical impact, they can worsen hemolysis or lead to heart failure due to regurgitation.

Therefore, it is vital to distinguish between different complications following prosthetic heart valve replacement.

Previous studies have pointed out possible causes of transprosthetic cuff leakage. The cuff, located between the metal stent and silicone ring, may become stretched at the commissure opposite to the others, resulting in transprosthetic leakage. We will address this topic in the presentation.

Reference:

1. Hiraoka A, et al. Transprosthetic Cuff Leakage of a Bovine Pericardial Aortic Bioprosthesis. Semin Thorac Cardiovasc Surg. 2019;31(4):773-779.

Learning points: Following artificial valve replacement, it is standard practice to assess perivalvular leakage and valve function immediately after cardiopulmonary bypass.

We should acknowledge that leakage, such as transprosthetic cuff leakage (a form of non-peri, non-trans-valvular leakage), may occur after cardiopulmonary bypass. It is essential to understand not only the potential causes of this leakage but also its implications for patient outcomes, including its resolution or persistence, and the overall prognosis.

32AP01-8

Spinal anesthesia versus general anesthesia for hip fracture surgery in elderly patients with moderate to severe aortic stenosis

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Background and Goal of Study: Anesthesia management for patients with severe cardiovascular complications, such as aortic stenosis, undergoing hip fracture surgery remains controversial. Historically, spinal anesthesia has been considered relatively contraindicated. However, recent studies suggest that spinal anesthesia may be safe and even beneficial for such high-risk patients.

This study investigates the impact of spinal versus general anesthesia on postoperative outcomes in patients with moderate to severe aortic stenosis undergoing hip fracture surgeries.

Materials and Methods: This single-center, IRB-approved retrospective study examined patients with moderate to severe aortic stenosis who underwent hip fracture surgery at St. Luke's International Hospital in Japan between January 2013 and December 2023.

Patients were divided into two groups based on the anesthesia method they received: spinal or general anesthesia. The primary outcome was 30-days mortality, and secondary outcomes included postoperative complications such as acute kidney injury, delirium, heart failure, aspiration pneumonia, and wound infection. We also investigated intraoperative hypotension, quantifying it in terms of vasopressor doses administered.

Results and Discussion: A total of 47 patients were included in the analysis, with 12 patients receiving spinal anesthesia and 35 patients receiving general anesthesia. There was only one death within 30days, with no statistically significant difference in mortality. There was no difference in incidence of postoperative complications such as acute kidney injury (OR 1.47: 95% CI, 0.33 to 6.65: P=0.62), delirium (OR 0.75; 95% Cl, 0.19 to 2.96; P= 0.68), and heart failure (OR 0.98; 95% CI, 0.86 to 11.2: P=0.99).

However, the spinal anesthesia group required smaller doses of intraoperative phenylephrine (0.58±0.63 versus 2.1±1.5 mg; P=0.001), suggesting a lower incidence of intraoperative hypotension.

Conclusion(s): The findings suggest that spinal anesthesia can be an option for patients with severe or moderate aortic stenosis undergoing hip fracture surgery. It appears to be a safe alternative to general anesthesia, with comparable mortality and complication rates in this high-risk population, and it may also contribute to hemodynamic stability.

32AP01-9

Changes in breathing maneuvers during preoxygenation impact myocardial function: a comparison of simulated and actual preoxygenation protocols

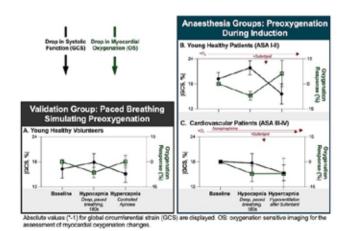
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Background and Goal of Study: Variations in breathing, such as those during the preoxygenation phase of induction lead to fluctuations in blood gases, which may be a trigger of perioperative myocardial ischaemia. We performed a cardiovascular MRI study to investigate the impact of breathing patterns on the heart in both a simulated preoxygenation setting in the absence of other medications and during the preoxygenation phase of general anaesthesia.

Materials and Methods: In an MRI, a validation group of 32 awake controls performed paced deep breathing for 180s (hypocapnia) followed by controlled apnoea (hypercapnia). MRI images were quantified for changes in myocardial oxygenation (OS) and global circumferential strain (GCS) as a marker of systolic contractility. The same imaging was applied during preoxygenation in patients undergoing general anaesthesia in an MRI both without (ASA I-II, n=6) and with coronary artery disease (CAD, n=3). The hypocapnia timepoint was at 180s of paced breathing, while hypercapnia was defined when spontaneous breathing seized due to induction drugs.

Results and Discussion: In the validation group, paced breathing decreased oxygenation (OS) yet increased contractility (GCS), both normalizing with apnoea (Fig A). These findings were mirrored by the ASA I-II anaesthesia group (Fig B), OS dropped (-7.1±2.6%, p<0.01), and GCS (-19.2±1.5 to -21.9±1.7%, p<0.01) improved with paced breathing, while hypoventilation led to a return in OS (6.2±7.9%, p=0.11 vs baseline) and reduction in GCS (-15.1±2.0% p<0.01). In CAD patients hypocapnia reduced OS with no change in function (Fig C) in post-stenotic myocardium. However, in the hypercapnia phase both OS (-7.1±9.2%) and GCS (-18.1±0.3 to -15.3±1.9%), worsened in unison.



Conclusion(s): In healthy hearts, changes in breathing patterns during preoxygenation cause fluctuations in cardiac function but deoxygenation was not linked to systolic dysfunction. Yet, in CAD patients, this procedure led to coupled deoxygenation and systolic dysfunction indicating inducible ischemia. Understanding the role of changing blood gases on cardiac function may improve the safety of induction in vulnerable patients.

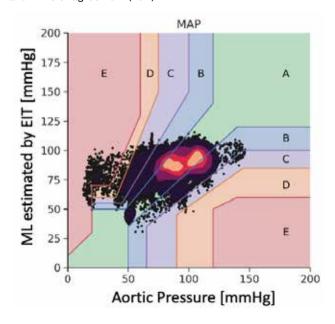
32AP01-10

Non-invasive beat-by-beat estimation of arterial blood pressures from electrical impedance tomography data processed by machine learning

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Background and Goal of Study: Hypotension in perioperative and intensive care settings is a significant risk factor associated with complications thereby increasing perioperative mortality. Continuous blood pressure monitoring is essential, yet challenging due to the invasive nature of current methods. Non-invasive techniques like Electrical Impedance Tomography (EIT) have been explored, but face challenges in accurately and consistently estimating blood pressure.

Materials and Methods: This study utilized a machine learning (ML) approach to predict systolic (SAP), mean (MAP), and diastolic arterial pressures (DAP) from EIT raw voltage measurements in an animal model involving 9 pigs (approved by the governmental ethical board: LALLF, M-V, Germany; No: 7221.3-1-037/19). A convolutional neural network (CNN) was trained on a dataset of 75 298 heartbeats using raw EIT voltage data to estimate SAP, MAP, and DAP in individuals unknown to the algorithm. The Intraclass Correlation Coefficient (3,1) with absolute agreement (ICC) was calculated comparing reference blood pressure measurements and ML-derived estimates. Bland-Altman plots for repeated measurements were calculated with the respective mean bias and limits of agreement (LoA).



Results and Discussion: MAP estimated by the ML-Model and aortic reference pressure are presented in a color-coded scatter plot in Figure 1. The ML model demonstrated moderate correlation with invasive blood pressure (ICC for SAP of 0.530, for MAP of 0.563, and for DAP of 0.521). Bland-Altman analysis showed a low mean bias with wide limits of agreement, indicating room for future improvements (mean bias for SAP was 2.56 mmHg with LoA from -32.34 to 37.46 mmHg, for MAP 3.31 mmHg with LoA from -28.85 mmHa to 35.47 mmHa and for DAP 3.69 mmHa with LoA from -26.70 to 34.09 mmHg).

Conclusion(s): ML techniques show promising results in non-invasive blood pressure monitoring by EIT. Despite limitations in the sample size and in the experimental setup, this study illustrates the potential of integrating ML in EIT signal processing for realtime, non-invasive beat-by-beat blood pressure monitoring.

32AP01-12

Perioperative outcomes of tricuspid valve surgery in adults with Ebstein's anomaly

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Background and Goal of Study: Tricuspid regurgitation (TR) is common in patients with Ebstein's anomaly (EA) who now frequently survive into late adulthood. Relatively little has been documented about the rate and manner of perioperative complications and early term patient outcomes. This study aims to review the perioperative outcomes of tricuspid valve surgery in adults with EA and severe TR.

Materials and Methods: A retrospectives cohort study was conducted on adult patients with EA and severe TR undergoing tricuspid valve surgery between January 1, 2012, and November 30, 2023, in a tertiary care university hospital. A comprehensive search of all relevant medical records was conducted, including hospital medical records and operation reports. Data collected included demographic variables, comorbidities, intraoperative and postoperative complications and mortality at 30 days and one year. Categorical variables are reported as frequencies and percentages (%) and continuous variables are summarised using mean and standard deviation. The Friedman test was used to compare pre- and postprocedural New York Heart Association (NYHA) functional class within patients.

Results and Discussion: Fourteen patients (9 women, 5 men) who underwent tricuspid valve replacement were recorded. The mean age at the time of surgery was 43.2±13.2 years. Preoperatively, 2 patients (14.3%) were NYHA Class I, 5 (35.7%) Class II and 7 patients (50%) Class III. In total, six patients (42.8%) had moderate or severe right ventricular dysfunction. The mean hospital stay was 14±5.3 days. Intraoperative complications occurred in 8 patients (57.1%). Also, eight patients (57.1%) had some episode of intraoperative hypotension.

Postoperative complications were noted in 9 patients (64.3%), with arrhythmias being most frequent, in 12 patients (85.7%). No perioperative, 30-day, or one-year mortality was. observed. Six patients improved their NYHA class at 30 days follow-up (p=0.058).

Conclusion(s): Tricuspid valve surgery in adults with EA showed excellent perioperative survival. However, the high incidence of intraoperative and postoperative complications highlights the need for careful perioperative management.

32AP02-1

HDC-Anaesthesia-Quality-Registry: a prospective observational study on patient-reported outcomes and quality of life after cardiac surgery and interventional procedures

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Background, Goal of Study: Patient-reported outcomes (PRO) are increasingly recognized as key measures for evaluating treatment effectiveness and guiding patient-centered care in cardiac anaesthesia. Health-related quality of life (HR-QoL) is a valuable metric for assessing patient's physical and mental well-being following cardiac surgery or interventional procedures.

This study aims to identify key demographic and clinical factors influencing PRO, thereby improving future care strategies for these patients.

Materials/Methods: This prospective observational study involves patients treated at the Heart- and Diabetescentre NRW in 2023 who underwent cardiac surgery or interventional procedures with anaesthesiological support. During the premedication consultation, patients were informed about participation in the registry and consented to a two-stage, one-year follow-up study. The SF-12 questionnaire was used to assess the physical and mental components of HR-QoL. Initial analyses focused on the impact of age, gender and clinical variables, such as preoperative anemia, on the PRO of 956 patients.

Further variables, including ventilation duration, ICU stay, and involvement in OR-patronage programs will be analysed in the overall analysis of approximately 2.000 patients.

Results/Discussion: Preliminary results showed a high response rate of 89.51%, with 93.91% of the returned questionnaires fully completed. The mean physical component summary (PCS) was 43.14, well below the mean of 50, while the mean mental component summary (MCS) was close to average at 49.79.

Gender comparisons revealed that women scored lower in both PCS and MCS. Our analysis showed a decline in PCS with increasing age and decreasing preop. hemoglobin, while MCS remained stable across all age categories.

Additional influencing factors will be explored in the final analysis. The findings suggest significant differences in PRO, highlighting the need for personalized preoperative assessments and postoperative care, particularly for older, female and anemic patients. Future interventions should be critically evaluated not only for their life-extending potential but also for their ability to enhance HR-QoL

Conclusion: Incorporating PRO and HR-QoL into clinical decisions enables personalized strategies, especially for vulnerable groups such as older, female, and anemic patients. Targeted strategies to address these disparities may optimize the effectiveness of care in cardiac anaesthesia.

32AP02-2

Use of VA-ECMO with cardiotomy suction for patient blood management in thoracoabdominal open surgery: a single center experience

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Background: Thoracoabdominal aortic aneurysm open repair (TAAA-OR) is associated with 30-day mortality rates between 8 to 25%. One of the main characteristics of TAAA-OR is massive hemorrhages that entail transfusion of multiple blood components.

Furthermore, after development of endovascular techniques, open surgery has been selected for challenging cases like collagenopathy or failure endovascular technique. These surgeries have a high risk of bleeding and the association between transfusion and morbidity has been widely described [1].

Case Report: We present the first 4 cases performed in our center with veno-arterial extracorporeal membrane oxygenation (VA-ECMO) and cardiotomy reservoir suction. In order to save blood products, we use heparin ratio 1:1 for VA-ECMO maintaining systemic activated clotting time (ACT) up to 250 seconds. In the cardiotomy reservoir we add more heparin locally and measure ACT over 350 seconds (Figure 1).

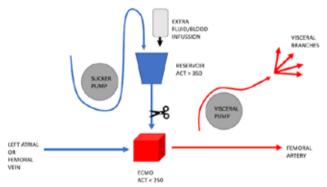


Figure 1.

This strategy has the advantage of avoiding the loss of fibrinogen, coagulation factors and platelets associated with the processed blood from a cell saver.

Discussion: Our intraoperative transfusion requirements were 9 red blood packed cell units in one patient and 8 in each of the other patients, 2 fresh frozen plasma units and 1 pooled platelet concentrate in each case. These data are far from usual requirements that are described on the literature [1].

The four patients were extubated between 12 and 72 hours postoperative. Although one of the patient dead by shock septic associated to bloodstream infection, the other three cases were discharge without transfusion related complications.

Reference:

1. S. Wang, C. Wang, Y. Gao, Y. Tian, J. Liu, Y. Wang, Risk factors of 30-day and long-term mortality and outcomes in open repair of thoracoabdominal aortic aneurysm, J. Cardiothorac. Surg. 19 (2024) 170. https://doi.org/10.1186/s13019-024-02666-2

Learning Points: The use of a cardiotomy suction and reservoir with a VA-ECMO may contribute to optimization of intraoperative patient blood management, limiting the incidence of coagulopathy during TAAA-OR.

32AP02-3

Takotsubo cardiomyopathy triggered by transcatheter mitral edge-to-edge repair (TEER): a rare case with atypical manifestations

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Background: Takotsubo Cardiomyopathy (TCM) is often referred to as stress-induced cardiomyopathy or "broken-heart syndrome." This report describes an unusual case of TCM in a patient undergoing TEER.

Case Report: An 87-year-old female with severe mitral regurgitation, pulmonary hypertension, and chronic renal insufficiency underwent TEER with successful MitraClip placement, significantly reducing MR without immediate complications. Several hours later, she developed acute hypotension without chest pain, elevated myocardial enzymes, or ECG changes.

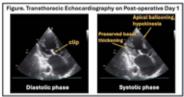
Echocardiography showed left ventricular (LV) systolic dysfunction and apical ballooning (figure), leading to a diagnosis of TCM. Conservative management was initiated, and follow-up echocardiography three days later showed full recovery of LV function. She was discharged without further issues.

Case series of Takotsubo syndrome following TEER

Table. Case Comparison

1" Author & Year	age/sex	onset	TEE findings	procedure outcome .	Journal
Anna L. S. 2023	83/male	P00 3	LVEF 25%	success, no complication	Arq Bras Cardol: Imagem cardiovasc
Ai-Ameen O. 2023	76/female	acute	LVEF 25-30%	success, femoral artery laceration	Chest (case report poster)
Shilla Z. 2021	92/mole	POD 2	LVEF 20-25%	success, no complication	JACC (case report poster)
Takahide K. 2021	86/female	POD 1	apical hypokinesi	s success, no-complication	Circ J
Takehiro N. 2020	87/male	POD 2	apical akinesis	success, no complication	EHJ-Case Reports
Joseph P. 2020	92/female	P00 1	LVEF 35%	success, oropharyngeal bleeding	Structural Heart

Note: MR, mitral regurgitation; PMR, primary MR, SMR, secondary MR; POD, post-operative day; LVEF, left ventricular ejection fraction



Discussion: TCM after TEER is a rare but recognized complication, with only case reports available. We compared the cases (table), and the proposed mechanisms include catecholamine surges or myocardial stress from the procedure or disease. Another possible mechanism is afterload mismatch¹ due to the loss of left atrial unloading from MR correction, leading to an acute rise in LV preload and transient myocardial dysfunction.

The long-term effects of post-TEER LV dysfunction remain inconclusive^{2,3} and require further study. Most cases show spontaneous recovery with conservative management, and prognosis is generally favorable with early diagnosis and supportive care.

References:

- 1. Siddarth J et al. Afterload Mismatch After MitraClip Implantation: Intraoperative Assessment and Prognostic Implications. J INVASIVE CARDIOL 2020.
- Shechter A et al. Correlates and prognostic implications of LVEF reduction after transcatheter edge-to-edge repair for primary mitral regurgitation. Eur Heart J Cardiovasc Imaging 2024.
- 3. Perl L et al. Acute Reduction in Left Ventricular Function Following Transcatheter Mitral Edge-to-Edge Repair. J Am Heart Assoc 2023.

Learning Points: This case illustrates the importance of considering TCM in TEER patients. Recognizing this condition promptly is essential for appropriate management and a favorable outcome.

32AP02-5

Intramuscularly applied regulatory macrophages positively influence microperfusion and prevent ulcer formation: findings from an ischemic mouse hindlimb model

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Background and Goal of Study: Regulatory Macrophages (Mreg) possess pro-angiogenic and regenerative potential and could represent potential candidates for cell therapy treatment in patients with Peripheral Arterial Occlusive Disease (PAOD)¹.

This study evaluates the therapeutic capacity of GMP grade Mreg (TRI-001) in a mouse model of hind limb ischemia.

Materials and Methods: Human monocytes were differentiated into TRI-001 using a GMP-compliant protocol² (Figure 1A). Immunodeficient mice underwent ischemic surgery on the right hind limb (Figure 1B) and were treated 24 hours later with intramuscular injections of TRI-001, Monocytes (cell control), or no-injection (sham control)

Blood flow and ulcer formation were monitored up to day 51, after which animals were sacrificed. Hind limb tissues were stained for CD31 using immunohistochemistry.

Results and Discussion: An immediate decrease of blood flow in the ischemic limbs after surgery was followed by a recovery of flow in all groups. On day 10, the flow values of the ischemic leg were approximately 50% of the values of the control leg. No significant differences were found between the treatment and control groups, indicating that neither Monocytes nor TRI-001 had a positive effect on macroperfusion.

However, histological analysis of neoangiogenesis revealed a significantly higher number of CD31 $^{+}$ vessels in the TRI-001-treated animals versus the Monocyte group (TRI-001: 8.78 \pm 2.58 vs Monocytes: 5.81 \pm 1.92; P = 0.004) and versus the no-injection control group (6.32 \pm 1.89; P = 0.043; Figure 1C).

In addition, the proportion of regenerative muscle fibers was by trend increased in the TRI-001 group (Figure 1C). A 20% incidence of non-healing ulcers was observed in the Monocyte and no-injection control group, while no ulcers were detected in the TRI-001-treated group (Figure 1C).

Conclusion(s): Intramuscularly applied TRI-001 enhance microperfusion and prevent ulcer formation. TRI-001 may serve as a promising cell therapy for ischemia-related conditions, such as PAOD.

Reference:

1. Hummitzsch, L. et al. 2019. 2 Zitta, K. et al. 2024.

32AP02-6

The impact of blood pressure and hypotension on the accuracy and trending ability of the fourth-generation FloTrac against continuous thermodilution in cardiac output monitoring

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Background and Goal of Study: Pulmonary artery catheter (PAC) thermodilution is often regarded as the clinical standard in cardiac output (CO) monitoring. However, its use has been criticised due to its highly invasive nature and the lack of evidence for improved outcomes. Less invasive techniques such as the widely used minimally invasive FloTrac system (FT) have been proposed, which estimates CO using arterial pressure waveform analysis. Currently, the effect of blood pressure (BP) on its performance. particularly during hypotension, remains unexplored.

This study aimed to evaluate the accuracy and trending ability of FT across a wide range of BP by utilizing unique data of patients who required prolonged periods of intraoperative hypotension.

Materials and Methods: Intra-operative CO measurements by PAC thermodilution (PAC-CO) and FT (FT-CO) were simultaneously collected in 33 patients, which yielded 4246 measurement pairs across mean arterial pressures (MAP) ranging from 16 to 120 mmHg. Data was stratified into MAP subsets of <40, 40-50, 50-60, 60-70 and >70 mmHg. Accuracy was assessed using Bland-Altman analysis and trending ability was evaluated using four-quadrant plots with a 20-minute interval and 15% center exclusion zone. Both analyses were executed on the entire dataset and on each subset.

Results and Discussion: Overall, FT-CO underestimated CO with a mean bias -0.87 L/min. The 95% limits of agreement were -3.30 to 1.55 L/min, the percentage error was 53.7% and the concordance rate was 78.0%. All MAP subsets showed similar results except for the subset with MAP >70 mmHg. FT demonstrated better performance in the subset with MAP >70 mmHg with a mean bias of -0.68 L/min, a 95% limits of agreement of -2.84 to -1.47 L/min, a percentage error of 44.4% and a concordance rate of 85.4%. There was clear relationship between (low) blood pressure and the performance of FT.

Conclusion(s): FT-CO is not interchangeable with PAC-CO at all predefined blood pressure ranges. However, FT performance did not worsen with decreasing MAP. These findings suggest that hypotension does not affect the performance of FT in estimating the CO.

32AP02-7

Anesthetic management in valve-in-valve-invalve transcatheter aortic valve replacement (TAVR): a case report and review of perioperative considerations

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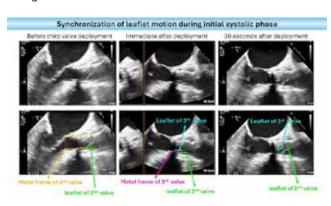
Background: TAVR is now a widely used therapeutic option, with favorable outcomes compared to surgical aortic valve replacement(SAVR). Over 20 years after first-in-man TAVR, more patients require second or higher-order re-implantations, presenting with complex conditions and challenging imaging. We report a TAVR-in-TAVR-in-SAVR case to examine the anesthesiologist's role in these complex scenarios.

Case Report: An 83-year-old male underwent SAVR(Freestyle, Medtronic) in 2005 for aortic stenosis. In 2018, he received TAVR(Evolute, Medtronic) due to degeneration of the surgical valve and the onset of aortic regurgitation(AR). In 2024, he was admitted for a third valve intervention due to TAVR valve degeneration causing recurrent AR. The key risk raised from the stacking of three valves, which may lead to coronary artery obstruction. Bilateral upper limb arterial access for coronary protection compromised continuous blood pressure monitoring during the procedure. The complexity of the aortic root increases technical difficulty, operative time, and contrast use, requiring careful renal protection and carrying a high risk of rupture. Continuous precise transesophageal echocardiography(TEE) monitoring is required for safety. A 3rd valve (Sapien 3, Edward) was deployed successfully. TEE revealed a unique phenomenon: the 2nd valve totally overhung the 3rd valve, and the latter one assisted in improving the dynamics of the former. We recorded valuable imaging showing the transition of leaflet motion of synchronization after deployment. The patient exhibited significant relief from heart failure symptoms and was discharged uneventfully.

Discussion: High-risk complex cardiac interventions are increasingly common, requiring anesthesiologists to have a thorough understanding of the pathophysiology, anatomy, procedures, and imaging diagnostics. Teamwork is essential for success.

Learning Points:

- 1. Both surgeons and anesthesiologists face significant uncertainties in complex procedures, making comprehensive teamwork and collaboration essential.
- 2. Most TAVRs now use transthoracic ultrasound without intubation, but TEE remains invaluable for detecting subtle, real-time changes.



32AP02-8

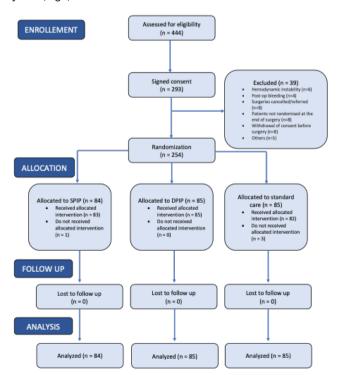
Effect of superficial and deep parasternal blocks on recovery after cardiac surgery with sternotomy: a randomized controlled trial

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Background and Goal of Study: Regional anesthesia seems to be an interesting technique to reduce the pain after cardiac surgery, but its effectiveness in improving recovery has been poorly studied so far. The objective of this study was to compare the effectiveness of the Superficial and the Deep Parasternal Intercostal Plane blocks (SPIP and DPIP respectively), in addition to standard care, versus the standard care, on the Quality Of Recovery (QoR) after cardiac surgery.

Materials and Methods: This trial was registered on ClinicalTrials.gov NCT05345639, on April 26, 2022. Ethical approval was granted by French Institutional Review Board. This was a singlecenter, randomized, controlled, single-blind study with a 1:1:1 ratio. Inclusion criteria were adult patients who underwent cardiac surgery via median sternotomy. Patients were randomized into three groups: a control group with standard care and no regional anesthesia, a SPIP group and a DPIP group. Regional anesthesia was performed with 0.2% ropivacaine, 20 mL on each side. The primary endpoint was the value of the QoR evaluated by the FQoR-15 at 24 hours after the surgery.

Results and Discussion: We randomized 254 patients in one years (Fig.1).



Demographic data are comparable in all respects between groups. The FQoR (primary endpoint) was not significantly different between the 3 groups or between the control group and the group with a parasternal block (either SPIP or SPIP) (p=0.248). Postoperative pain and analgesic consumption were not different between groups, but the pain values were very low across all groups (NRS at 24h 2.0 [3.0-0.0]). However, the incidence of pneumothorax was higher in the DPIP group (p= 0.032). There was no difference in other complications.

Conclusion: Regional anesthesia using bilateral DPIP or SPIP after sternotomy was not associated with improved postoperative recovery compared with standard management. The SPIP seems safer, as the DPIP was associated with a higher occurrence of pneumothorax in our study.

Additional studies are therefore needed to confirm this security data and to identify painful patients who could benefit from a parasternal block after cardiac surgery.

32AP02-9

A rare case of sutureless aortic valve dislocation immediately after caridiopulmonary bypass

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Background: Sutureless aortic valve replacement (AVR) is an innovative approach for patients who require surgery for aortic valve stenosis. It enables faster implantation with shorter cardiopulmonary bypass and operative time. However, reports regarding the complications associated with sutureless AVR remain limited. Case Report: A 72-year-old male was admitted for evaluation of repeated syncope over the last 2 months. After severe agrtic stenosis was diagnosed by cardiac echocardiography, surgical procedure with a Perceval sutureless valve was scheduled. During weaning from cardiopulmonary bypass (CPB), transesophageal echocardiography revealed a dislocated and dysfunctional left coronary cusp of the Perceval valve, along with a severe paravalvular leak that resulted in diastolic mitral regurgitation. In the second run of CPB, left coronary cusp of Perceval valve was confirmed to be dislocated to the cephalad, and a new sutureless valve was then placed.

Discussion: Sutureless AVR represents an alternative to both conventional AVR and transcatheter AVR. This innovative technique, which eliminates the need for suturing the new valve into place, has been introduced in recent years. Consequently, sutureless AVR warrants direct comparison with transcatheter AVR to evaluate its relative benefits and limitations.

Several reports suggest that sutureless AVR reduces certain complications associated with transcatheter AVR, such as the increased risks of postoperative stroke, atrioventricular block. and paravalvular leak. Additionally, the surgical approach facilitates the simultaneous correction of other valvular or coronary diseases.¹ In this way, while the benefits are often emphasized, reports on the various complications associated with sutureless AVR are still scarce.

Reference:

1.The Perceval Sutureless Aortic Valve: Review of Outcomes, Complications, and Future Direction. Ramsey Powell, et al. Innovations.2017;12:155-173.

Learning Points: Following artificial valve replacement, it is standard practice to assess perivalvular leakage and valve function immediately after CPB

In transcatheter aortic valve implantation, valve displacement can occasionally occur during surgery, leading to acute severe aortic regurgitation. However, there are few reports documenting such

occurrences in sutureless valve migration. Our observation revealed that even the Perceval valve can become dislodged during surgery, causing significant aortic regurgitation.

32AP02-10

Acute type A aortic dissection and successful surgical repair with cardiopulmonary bypass in a pregnant woman at 14 weeks of gestation

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Background: Cardiovascular disease affects over 1-4% of pregnancies globally and poses serious health risks, with aortic dissection being a life-threatening complication for both mother and fetus (1).

Cardiac surgery with cardiopulmonary bypass (CPB) during pregnancy poses challenges due to its unknown long-term impact on the fetus, however, the mortality rate for untreated type A dissection rises by 1–3% per hour after presentation (2).

Case Report: We present the case of a 24-year-old pregnant patient at 14 weeks of gestation who was diagnosed with acute type A aortic dissection.

Following a multidisciplinary discussion with a cardiologist, cardiac surgeon, anaesthetist and obstetrician-gynaecologist, an urgent replacement of an ascending aorta was recommended. The patient's EuroSCORE II perioperative risk was 2.64%, and ASA class IV.

The patient underwent ascending aorta replacement under general anaesthesia with CPB. Induction was performed using midazolam, fentanyl, propofol, and rocuronium. Anaesthesia was maintained with sevoflurane, supplemented by propofol and fentanyl infusions. The patient was transferred to the ICU and extubated after 4 hours. The postoperative course was uneventful. At 27 weeks of gestation due to preeclampsia, a cesarean section was performed, resulting in the birth of a healthy male infant.

At the six-year follow-up, chest CTA showed stable aortic anatomy with no concerning progression. The child was reported to be in good health.

Discussion: Aortic dissection, occurring in 5.5 cases per million pregnancies, poses significant maternal and fetal risks. Pregnancy-related changes increase susceptibility to vascular complications, requiring swift intervention. While open-heart surgery and CPB can be lifesaving, their fetal impact remains uncertain, complicating treatment. This case emphasizes the importance of early diagnosis and prompt intervention for improved maternal and fetal survival.

References:

1. Sahu AK, et al. Cardiovascular diseases in pregnancy. Curr Cardiol Rev. 2022;18(1).

2. Kohli E, et al. Acute type A aortic dissection in pregnancy. Case Rep Emerg Med. 2013;2013:390670.

Learning Points: The involvement of multidisciplinary teams is vital for optimizing perioperative management in high-risk obstetric cardiac patients, ensuring comprehensive care and improving patient outcomes. Early intervention for ascending intramural hematoma is essential to prevent progression to type A dissection.

32AP02-11

Perioperative hemodynamic monitoring during the removal of an RVAD using the ProtekDuo cannula: a case report

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Background: The ProtekDuo cannula, connected to a pump such as the Levitronix CentriMag[™], provides effective right ventricular assist device (RVAD). However, its design and placement in the right heart chambers and pulmonary artery limit the ability to perform invasive hemodynamic monitoring using a Swan-Ganz catheter. We present a case that highlights these challenges and the strategies employed to manage hemodynamic during RVAD withdrawal.

Case Report: A 55-year-old man presented with an inferior myocardial infarction complicated by ischemic ventricular septal defect (VSD). Initially in cardiogenic shock within 24 hours, he was supported with veno-arterial extracorporeal membrane oxygenation (ECMO). Surgical closure of the VSD and a single coronary artery bypass graft (LIMA to LAD) were performed; however, biventricular dysfunction, predominantly right-sided, persisted, preventing ECMO weaning. After 26 days, ECMO was transitioned to RVAD with a ProtekDuo cannula and Levitronix CentriMag[™] pump.

The patient was excluded from heart transplantation due to comorbidities, directing the strategy towards bridge to recovery. After 55 days of RVAD support, the ProtekDuo cannula was removed under general anesthesia in the operating room. Perioperative hemodynamic monitoring relied on transesophageal echocardiography (TEE) to guide pharmacologic support adjustments. Pharmacologic support included inotropes (adrenaline, dobutamine), vasopressors (norepinephrine), and pulmonary vasodilators (inhaled nitric oxide and iloprost). Hemodynamic stabilization was achieved using echocardiographic parameters such as right ventricular to right atrial gradients with PAPs estimate, and ventricular functional indices (FAC, TAPSE, and LVOT VTI).

Despite severe right ventricular dysfunction, RVAD removal was successful. Over the next five days, the patient was weaned off inotropes under echocardiographic guidance.

Discussion: This case illustrates the complexities of perioperative hemodynamic management during RVAD withdrawal using the ProtekDuo cannula. The absence of invasive pulmonary artery pressure monitoring required reliance on echocardiographic and gasometric parameters to adjust pharmacologic support.

Reference:

Brewer JM, Maybauer MO. The ProtekDuo Cannula: A Comprehensive Review of Efficacy and Clinical Applications in Right Ventricular Failure. *J Clin Med.* 2024;13(14):4077. doi:10.3390/jcm13144077. PMID: 39064117; PMCID: PMC11278424.

32AP02-12

Respiratory failure after cardiac surgery: a single-center retrospective data review

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Background and Goal of Study: Respiratory failure, particularly acute respiratory distress syndrome (ARDS), is one of the most threatening complications after cardiac surgery, which is followed by longer intensive care unit (ICU) stay and higher mortality rate. This study is aimed to evaluate the frequency of respiratory failure, to analyze the perioperative factors and their impact on the development of ARDS in patients undergoing cardiac surgery. Materials and Methods: The retrospective data review of 81 adult patients, who underwent cardiac surgeries at a single center, was conducted. The analysis included demographic characteristics, intraoperative parameters (cardiopulmonary bypass (CPB) duration, aortic clamping time, lactate levels), ventilation parameters (FiO₂, PEEP, dynamics of oxygenation index), blood transfusion details (fresh frozen plasma (FFP), red blood cell mass), and postoperative radiological changes. Statistical analysis methods were used to evaluate the correlation between these factors and the occurrence of ARDS.

Results and Discussion: The mean age of patients was 61.5 ± 11 years, and a weak positive correlation was found between age and the development of ARDS (r = 0.21; p = 0.04). The presence of ≥2 comorbidities increased the risk of ARDS (r = 0.30; p = 0.01). Pre-existing pulmonary diseases were associated with a higher risk of ARDS (r = 0.38; p = 0.005). ARDS developed more frequently in patients who underwent surgery with CPB (36.7%) compared to those who had off-pump surgery (10.0%; p < 0.01). The duration of CPB (mean: 140 ± 52 min) and aortic clamping (mean: 105 ± 37 min) were independently associated with the development of ARDS (p < 0.05). ARDS was more frequent in patients with a CPB duration over 150 minutes (r = 0.34; p = 0.01). Intraoperative lactate levels were significantly higher in patients with ARDS (3.1 \pm 1.2 mmol/L) compared to those without ARDS (1.9 ± 0.8 mmol/L), and these showed a moderate positive correlation with the development of ARDS (r = 0.42; p < 0.001). ARDS was strongly associated with mechanical ventilation in the ICU for more than 6 hours (r = 0.47; p < 0.001). Additionally, patients with ARDS had a lower oxygenation index prior to extubation (r = -0.29; p = 0.02). Transfusion of FFP over 600 ml was significantly associated with ARDS development (r = 0.35; p = 0.003), while the transfusion of red blood cell mass (>400 ml) did not show a significant impact (p = 0.08).

Postoperative radiological changes were present in 60% of patients with ARDS, compared to only 25% in the non-ARDS group (p < 0.001). The average length of stay in the intensive care unit (ICU) was significantly longer for patients with ARDS (7.4 ± 3.1 days) compared to those without ARDS (4.1 \pm 2.7 days, r = 0.39; p = 0.002).

Conclusions: ARDS after cardiac surgery is significantly associated with older age. CPB use, elevated lactate levels, largevolume FFP transfusion, and the existing comorbidities. The ICU stay duration is longer in patients with ARDS. These results demonstrate the importance of careful monitoring, protective ventilation, rational use of blood transfusions, and individualized care for patients undergoing cardiac surgery with ARDS risks.

32AP02-13

Postprocedural aortic dissection after transcatheter aortic valve migration

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Background: Dislocation and migration of the valve during transcatheter aortic valve replacement (TAVR) is a critical and potentially catastrophic complication. If not promptly addressed, it can significantly worsen patient outcomes. As one possible complication, aortic dissection could theoretically be triggered by the aggressive retrieval of large devices beyond the aortic arch, although reports of such cases are rare.

Case Report: An 83-year-old male was admitted with severe aortic stenosis, confirmed by echocardiography, and TAVR was scheduled under general anesthesia. Despite the use of controlled ventricular pacing and fluoroscopic guidance, the selfexpanding valve immediately dislodged after deployment and migrated into the ascending aorta. Efforts to retrieve the valve percutaneously with a snare were unsuccessful. In response, a balloon-expandable valve was deployed to avert acute aortic regurgitation. Transesophageal echocardiography revealed a aortic dissection during the reinsertion interventions of the balloon-expandable valve. Despite the risk, the intervention was completed to avert acute heart failure due to severe acute aortic regurgitation, followed by urgent aortic replacement surgery performed by the cardiac surgical team.

Discussion: Cranial migration into the ascending aorta can result from various causes, including improper positioning, an undersized prosthesis, a tortuous or angulated aorta, heavily calcified or bulky leaflets, as well as post-dilatation performed in a borderline high position. Premature beats during rapid pacing or complete failure of pacing may also contribute. The embolization of the transcatheter heart valve can have devastating consequences, obstructing blood flow to vital organs, including the brain, and requiring immediate surgical intervention. Aortic dissection in the context of TAVR may occur due to several factors, including the mechanical forces exerted during the procedure, such as balloon dilation or the insertion of the valve prosthesis itself.1

References:

1. Surgery after Failed Transcatheter Aortic Valve Implantation: Indications and Outcomes of a Concerning Condition. Mohamed Salem, et al. J. Clin. Med. 2022, 11(1), 63

Learning Points: TAVR-related aortic dissection is a rare yet lifethreatening condition that may frequently remain undiagnosed. Nevertheless, we were able to promptly and accurately diagnose the aortic dissection through TEE.

32AP03-1

Brrrr its cold in the operating room! Clots forming while on cardiopulmonary bypass leading to a diagnosis of cold agglutin disease

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Background: Cold agglutinins in cardiac surgery may present with use of hypothermic cardiopulmonary bypass (CPB)

Case Report: 81 Y male hospitalized for acute bronchitis subsequently found to have severe coronary artery disease for which he underwent coronary artery bypass grafting. All anesthetic procedures and CPB were performed and initiated in standard fashion. While administering a dose of cardioplegia through the coronary sinus, perfusion quickly recognized that the cardioplegia line was filled with microscopic clots. Despite flushing the cardioplegia the clots continued forming within the line in the cardioplegia solution (See pictures 1&2). Cold agglutinin disease was suspected, and perfusion drew and performed a bedside ice syringe test providing additional diagnostic support (See pictures 3&4). No hemolysis was noted in urine and no change in hemodynamics occurred acutely. The decision was made to proceed with normothermic CPB and administration of warm cardioplegia at intervals of 10 minutes and the case proceeded as expected. The patient continued care in the CVICU where sedation was weaned and no neurological deficits identified. Labs resulted positive DAT complement with a negative IgG in setting of low haptoglobin and previous cold induced microthrombi/agglutination consistent with cold agglutinin disease. Despite creatinine peaking at 2.2 no hemolysis or dialysis postoperatively was required and he recovered as expected. There were no previous hematologic issues or family history of blood disorders and follow-up CT chest abdomen pelvis showed no underlying lymphadenopathy/lymphoproliferative disorder.



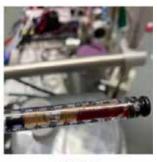
Picture #1



Picture #3



Picture #2



Picture #4

Discussion: This case highlights that a rare diagnosis of cold agglutin disease can present while on CPB. Early recognition and prior reviews suggest that patients can safely undergo normo-

thermic cardiopulmonary bypass at 37°C and warm cardioplegia without increased mortality or morbidity1.

Reference:

Barbara DW, Mauermann WJ, Neal JR, Abel MD, Schaff HV, Winters JL. Cold agglutinins in patients undergoing cardiac surgery requiring cardiopulmonary bypass. J Thorac Cardiovasc Surg. 2013 Sep;146(3):668-80.

32AP03-2 Chest pain during late pregnancy: undiagnosed aortic dissection

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Background: Aortic (Ao) dissection during pregnancy is rare (0.0004%) but fatal (1). We describe an undiagnosed case during delivery, highlighting differential diagnosis and echocardiography. Case Report: 34-year-old woman, 35 weeks pregnant, with 4 days of chest pain radiating to the neck and back, abdominal pain, fever (37.8°C) and uterine contractions. She had cervical cerclage at 22 weeks, intrauterine growth restriction type I and RH-. Marfanoid features went unnoticed. ECG, X-ray, troponin and bedside transthoracic echocardiography (TTE) were unremarkable. Lab showed Hb 10.5 g/dL and D-dimer 4719 ng/mL. Labour was induced for suspected chorioamnionitis. An epidural catheter was placed but removed after delivery. The newborn required Neonatal Intensive Care for acute respiratory distress. Persistent chest pain and new hypotension prompted a CT scan, revealing a 59 mm Ao root dilation, 49 mm ascending aorta and a type A Ao dissection (Fig. 1).



Figure 1.

She was referred to a tertiary-level hospital where TTE revealed moderate Ao regurgitation due to a flap compromising Ao valve. Ao arch and mechanical valve replacement were performed under 22°C hypothermia, receiving 3 RBC units, 3 g fibrinogen and 500 IU prothrombin complex concentrate. She was discharged on day 15 without any complications.

Discussion: Diagnosing Ao dissection during pregnancy is difficult due to nonspecific symptoms and radiation concerns. Aortopathy is often identified post-dissection (50%) (2). Chest pain was attributed to chorioamnionitis after acute coronary syndrome was ruled out. Pulmonary embolism and Ao syndromes were reconsidered as symptoms worsened. Vaginal delivery with epidural analgesia is only recommended with Ao diameters <45 mm.

Learning Points: For unexplained chest pain in pregnancy, we should search for signs of aortopathies and perform a comprehensive TTE to exclude Ao syndromes and plan a safe delivery. References:

1. Russo M, et al. Aortic dissection in pregnancy and the postpartum period. Semin Vasc Surg. 2022 Mar 1;35(1):60-8. 2. Braverman AC, et al. Clinical Features and Outcomes of Pregnancy-Related Acute Aortic Dissection. JAMA Cardiol. 2021 Jan;6(1):58-66.

32AP03-3

A rare complication during percutaneous pulmonary vein ablation: do not underestimate vour enemy

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Background: Intraprocedural transoesophageal echocardiography (iTOE), even if not extended to all centers, plays a critical role in the catheter ablation of arrythmias. It enhances the safety of transseptal punctures and enables the early detection of complications, such as thrombus formation in high-risk patients, particularly those with a patent foramen ovale (PFO) or a history of previous thromboembolic events.

Case Report: 59 year-old gentleman, with past medical history of paroxysmal atrial fibrillation who presented with transient ischemic attack (TIA) in 2019 and underwent a pulmonary vein ablation 3 years ago. Since then, he had been taking apixaban, and now, he presented to emergency room with atrial fibrillation recurrence. He was rescheduled for pulmonary vein ablation redo. Last dose of apixaban was scheduled 12 hours before the procedure, but the patient inadvertently held it for 24 hours instead. The initial iTOE did not show any endocavitary thrombus or pericardial effusion, but it did reveal the presence of spontaneous echo contrast in the right atrium (RA) and a previously undiagnosed PFO. The first transeptal puncture was performed under iTOE guidance without complications. During the second transeptal puncture, an image compatible with a 3 cm thrombus attached to the tip of the guidewire was observed.

According to our center protocol, 100 IU/kg of intravenous sodium heparin were administered. Given the high thromboembolic risk due to the history of TIA and the diagnosis of PFO, the medical team decided to withdraw all catheters under aspiration and postpone the procedure. The final iTOE did not show any thrombus or other complications. Emergence from anesthesia took place uneventfully and the patient was discharged the same day without any neurological deficit.

Discussion: Until recently, there has been little focus on intraprocedural guidewire thrombosis. This case highlights the relevance of strictly following anticoagulation prior to arrhythmia ablation, as the main international societies recommend uninterrupted or minimally interrupted oral anticoagulation¹. Despite variability between centers, it is also remarkable the crucial role of iTOE in diagnosing potential complications during the procedure, as recommended by the main European and American guidelines^{2,3}.

References:

- 1. J Am Coll Cardiol. 2024 Jan 2;83(1):109-279.
- 2. J Am Soc Echocardiogr . 2016 Jan;29(1):1-42.
- 3. J Am Coll Cardiol. 2019 Feb 5;73(4):488-516.

32AP03-4

Postoperative atrial fibrillation (POAF) after cardiac surgery: bridging the gap in detection with a wearable cardiac rhythm monitoring device

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Background and Goal of Study: POAF is one of the most common complications in patients undergoing cardiac surgery (rates ranging from 30 to 50%)1. However, there is a significant knowledge gap on the incidence of POAF after discharge. Continuous cardiac rhythm monitoring has shown enhanced detection of POAF during the initial 30 days after surgery2.

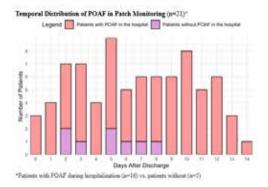
The aim of this study is to characterize the occurrence of POAF after discharge and to determine whether cardiac rhythm monitoring with a wearable patch device for 14 days after discharge is feasible in bridging the gap in POAF detection.

Materials and Methods: After IRB approval, 100 patients who underwent open-heart surgery using cardiopulmonary bypass were enrolled in this prospective clinical study. Shortly before discharge from the hospital, patients were asked to wear a portable ECG patch monitor (MultiVital ECG, vivalink) for two weeks. 77 patients were included in the analysis.

We reviewed charts and analyzed ECGs to detect POAF during hospitalization. ECG patch monitoring was used to detect AF after discharge, using both automated and manual ECG analysis. AF was considered relevant if it lasted longer than 30s, consistent with the diagnostic guidelines.

Results and Discussion: In our cohort, 42% of the patients developed POAF in the hospital and 27% were found to have AF on the patch. In 24% of patients with POAF, AF was first identified on continuous patch monitoring and was otherwise not picked up while hospitalized. In the majority of these cases (80%), AF was not diagnosed using alternative modalities until the 3-month follow-up. The majority of AF was paroxysmal AF, with many episodes lasting less than five minutes.

AF on patch* N=21 (27.3%)	No AF on patch* 30=56 (72.7%)
	1 (1.8) 55 (98.2)
16 (18.2) 5 (23.8)	16 (28.6) 40 (71.4)
AF on patch 10=19 (28.8%)	No AF on poich 30+47 (83.9%)
	1 (2.1) 46 (97.9)
	£ (42.1) 11 (57.9)



Conclusion(s): Almost a quarter of the patients with AF on continuous patch monitoring were not found to have POAF in the hospital. Without the ECG patch, these patients would likely have gone undiagnosed.

Our findings demonstrate that continuous cardiac rhythm monitoring for 14 days after surgery enhances the detection of POAF following cardiac surgery. The clinical significance of detecting POAF after discharge needs to be investigated in future studies.

32AP03-5

Real time quantification of atrioventricular coupling during the induction of general anaesthesia with cardiovascular MRI

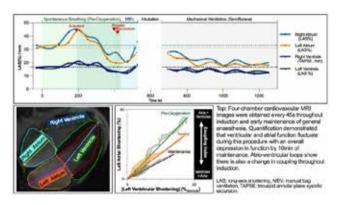
D. Kaiser¹, T. Schweizer¹, L. Grob¹, A.T. Huber². D.P. Guensch^{1,2}, K. Fischer¹ ¹Inselspital, Bern University Hospital, University of Bern, Department of Anaesthesiology and Pain Medicine, Bern, Switzerland, 2Inselspital, Bern University Hospital, University of Bern, Department of Diagnostic, Interventional and Paediatric Radiology, Bern, Switzerland

Background and Goal of Study: While the induction of general anaesthesia is associated with a higher risk for cardiac complications, the precise impact it has on all four chambers of the heart is unknown.

Applying novel cardiovascular MRI that acquires images continuously while free breathing, we investigated how left and right atrial (LA, RA) and ventricular (LV, RV) function and the atrio-ventricular coupling change throughout induction.

Materials and Methods: Three patients (ASA-PS≤II) scheduled for elective surgery underwent induction inside an MRI. Fourchamber images were acquired every 45s from the awake state until 10 min of maintenance. Long-axis-shortening (%) was calculated for the LA, RA and LV, while RV function was evaluated using tricuspid excursion (mm). Atrio-ventricular loops were created, and the slope defined the coupling index.

Results and Discussion: In comparison to the awake baseline (LV: -15.5±0.3%, RV: 20.6±3.2mm, LA: 30.7±4.2%, RA: 37.9±5.3%), preoxygenation increased function in all chambers (LV: -17.3±0.8%, RV: 24.0±2.5mm; LA: 41.7±6.8%, RA: 41.1±6.0%). Atrial function improved more than the ventricular function indicated by a steeper slope of the coupling loops (LA/LV: 1.6±0.2 to 2.0±0.5. RA/RV: 1.7±0.3 to 1.9±0.2). After induction and installation of mechanical ventilation, function continually dropped. By 10min of sevoflurane maintenance, a reduction in ventricular function was observed (LV: -13.7±0.6%, RV: 15.3±2.5mm). The largest depression was observed in the atria (LA: 16.6±4.0%, RA: 22.8±2.0%). By this point, the coupling indices had reversed, with the atrial function decreasing more in comparison to the ventricular decline (LA/LV: 1.2±0.1 RA/RV: 1.5±0.1).



Conclusion(s): Using perioperative cardiovascular MRI, we quantified that bi-atrial and ventricular function fluctuate throughout the induction of general anaesthesia with a significant drop in atrial function with maintenance, that was decoupled from the ventricles. These findings shed light on the rapidly changing conditions that all four chambers of the heart are exposed to and may help anaesthetists manage induction in patients with atrial or ventricular dysfunction.

32AP03-6

Safety of ultra-fast-track extubation in the Operating Room in adult minimally invasive and robotic cardiac surgery background

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Background: Early extubation within 6 hours following cardiac surgery has been shown to shorten ICU stays and reduce resource utilization.1

However, ultra-fast-track extubation in the operating room (OR) remains controversial, with only a few facilities in Japan adopting this practice. Safety of extubation in the OR after minimally invasive cardiac surgery (MICS) including robotic surgery has not been fully established.

This study aims to evaluate the safety of ultra-fast-track extubation in the OR following MICS.

Methods: This single-center, IRB-approved retrospective study analyzed patients who underwent MICS at St. Luke's International Hospital between January 2011 and February 2024, Patients were categorized as follows:

- 1. Ultra-fast-track OR extubation
- 2. Ultra-fast-track OR extubation with NPPV (non-invasive positive pressure ventilation)
- 3. ICU extubation

Primary outcomes were ICU stay duration and total hospitalization length. Secondary outcomes included risk factors for NPPV after extubation in the OR.

Results: Of 120 patients (Mitral valve repair: 88, Aortic valve replacement: 6, Tricuspid valve repair: 11, Coronary artery bypass grafting: 15) included in the study, 6 were excluded due to reoperation or intraoperative complications. Of the remaining 114 cases, 61 were in the OR extubation group, 9 in the OR extubation with NPPV group, and 44 in the ICU extubation group. There were no cases of reintubation following extubation in the OR.

Body mass index (BMI) (25.3 vs 22.2 vs 23.0, P = 0.046), preoperative albumin levels (4.5 vs 4.2 vs 3.9 g/dL, P = 0.002), and intraoperative norepinephrine dosage (14.0 vs 4.9 vs 10.9 mL, P = 0.045) differed significantly between groups.

No significant differences were found in ICU stay (4.1±1.7 vs 3.1 ± 1.6 vs 4.5 ± 4.2 days; P = 0.117) or total hospitalization (10.1 ±4.3 vs 11.1±6.6 vs 16.8±25.3 days; P = 0.264).

Factors associated with need for NPPV after OR extubation included higher BMI (OR 1.33; 95% CI, 1.04 to 1.84; P = 0.045) and higher intraoperative norepinephrine dosage (OR 1.14; 95% CI, 1.03 to 1.29: P = 0.021).

Conclusion(s): Ultra-fast-track OR extubation after MICS was comparable to extubation in the ICU in terms of length of ICU stay and total hospitalization. BMI and norepinephrine dosage were risk factors for NPPV following OR extubation.

References:

1. Subramaniam K, DeAndrade DS, Mandell DR, et al. Predictors of operating room extubation in adult cardiac surgery. J Thorac Cardiovasc Surg. 2017;154(5):1656-66.e2

32AP03-7

Five years Follow-Up of Neurologic Outcome after Minimally Invasive Cardiac Surgery trial (FUNOMICS): is there evidence for late cognitive decline?

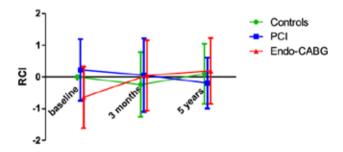
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Background and Goal of Study: Neurologic complications after cardiac surgery are a major cause of morbidity. In minimal invasive cardiac surgery, MICS, perfusion to the brain is often provided via retrograde cardiopulmonary bypass flow. As such, the brain is exposed to aortic atheroma located distal to the cerebral vessels. Stessel et al. demonstrated that the incidence of poor neurocognitive outcome until three months after endoscopic-CABG is low and comparable with percutaneous coronary intervention (PCI) (NOMICS trial). Three groups were prospectively followed: an endoCABG group, a PCI group and a healthy matched control group. A battery of neurocognitive tests was performed to establish the incidence of postoperative cognitive dysfunction (POCD) at baseline, 3 months and now also repeated 5 years after baseline.

Materials and Methods: All patients and volunteers who underwent three months follow-up in the NOMICS trial were invited to undergo the same battery of neurocognitive testing on 6 domains. Based on the Z-scores of the tests, the Reliable Change Index (RCI) was calculated. Late POCD was defined as an RCI ≤-1.645. Positive values indicate improvement.

Results and Discussion: Twenty patients in the endoCABG group, 18 in the PCI group and 17 controls underwent testing. In the endoCABG group, mean RCI increased from -0.64 (+/- 0.97) at baseline to 0.19 (+/- 1.04) at 5 years. In the PCI-group, mean RCI declined from 0.22 (+/- 0.97) to -0.19 (+/- 0.8) at 5 years follow-up. For the control group, baseline RCI was 0 per definition and evolved to 0.1 (+/- 0.95) at 5 years. P-values were 0.44 and 0.61 at 3 months and 5 years respectively.

Our results do not show any evidence for POCD 5 years after coronary surgery with retrograde perfusion. Also, both coronary artery diseased patient groups did not perform significantly worse 5 years after therapeutic intervention.



Conclusion: We did not find any evidence of late POCD 5 years after MICS with retrograde perfusion.

References:

1. Stessel et al. NOMICS trial: An observational prospective cohort study https://doi.org/10.1371/journal.pone.0242519

32AP03-8

Perspectives of anaesthesiologists on implementing findings from preexisting cardiovascular magnetic resonance imaging reports for perioperative risk assessment: an international survey

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Background and Goal of Study: Cardiovascular magnetic resonance (CMR) has emerged as a powerful diagnostic tool, offering precise insights into cardiac structure and function. The likelihood of patients having diagnostic CMR findings available in their medical records is rapidly increasing, yet how anaesthesiologists utilize this data remain unclear. Therefore, we investigated anaesthesiologists' perspectives on CMR for risk stratifying patients for anaesthesia.

Materials and Methods: An anonymous online survey was distributed to anaesthesiologists worldwide. The survey included 42 multiple choice questions designed to assess anaesthesiologists' general knowledge and use of diagnostic CMR reports.

Results and Discussion: A total of 414 anaesthesiologists from 24 countries participated. Half (52%) indicated they work in cardiac, vascular or thoracic anaesthesia (CVA), Functional capacity was the most utilized cardiovascular risk-assessment tool (94%) followed by imaging in general terms (84%).

Specifically, 68% of respondents incorporated CMR reports into evaluations when these were available in patients' medical history. although it was more common for anaesthetists working in CVA to incorporate CMR (70% vs 60%, p=0.03). The majority understood and often implemented left (CVA: 63% vs non-CVA: 51%, p<0.01) and right (CVA: 55% vs non-CVA: 40%, p<0.01) ventricular anatomy and function.

CMR is well known for characterizing myocardial tissue features, and myocardial perfusion assessments of inducible ischaemia were assessed by half of the anaesthetists (CVA: 55% vs non-CVA: 41%, p<0.01) with even less using the presence of myocardial scar (CVA: 33% vs non-CVA: 21%, p<0.01).

Few knew and implemented modern CMR techniques characterizing diffuse myocardial fibrosis (CVA: 14% vs non-CVA: 7%, p<0.01) and oedema (CVA: 11% vs non-CVA: 4%, p<0.01). A majority recognized CMR's future potential for perioperative risk evaluation (75%) and expressed a desire to integrate it more into clinical practice (53%).

Conclusion(s): Anaesthesiologists worldwide, are using CMR data for perioperative cardiovascular risk assessments. Even anaesthesiologists not working in CVA incorporate CMR findings, although to a lesser extent than colleagues in CVA.

Nonetheless, application predominantly relies on traditional metrics, with modern tissue characterization techniques being less well understood. Consequently, CMR' full potential for perioperative risk stratification is not realized.

32AP03-9

Identification of preoperative risk factors for intraoperative hypotension during cardiac surgical interventions

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Background and Goal of Study: Intraoperative hypotension (IOH) is a common adverse effect of general anesthesia, with serious potential consequences, influenced by preoperative factors. This study investigates IOH and analyzes preoperative risk factors contributing to its occurrence during cardiac surgery.

Materials and Methods: This prospective study was conducted over one year, involving patients undergoing cardiac surgery at a single medical center. Preoperative data, including demographic information, comorbidities, and chronic cardiovascular therapy, were collected to assess their impact on IOH. Binary logistic regression was used to identify risk factors.

Results and Discussion: The IOH group consisted of 207 patients (34%), while the control group included 402 patients (66%). The average age was 65.56±9.56 years. Each year of age incrementally increased the risk of IOH (Odds ratio 1.047, p < 0.0005). Patients with ASA IV had a higher risk of IOH compared to ASA III patients (Odds ratio 8.323, p < 0.0005).

Preoperative discontinuation of ACE inhibitors or ARBs at least 12 hours before surgery was associated with a 70% reduction in complications (Odds ratio = 0.289, p < 0.003).

Conclusion(s): Preoperative risk factors for IOH include age. emergency surgery, higher ASA score, and use of ACE inhibitors or ARBs within 12 hours of surgery. Key cardiovascular predictors are Left Main stenosis, atrial fibrillation, myocardial infarction, and heart failure.

Comorbidities such as anemia, carotid artery stenosis, diabetes mellitus, and chronic renal insufficiency also significantly increase the risk of IOH.

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- 1. Katori N, Yamakawa K, Kida K, Kimura Y, Fujioka S, Tsubokawa T. The incidence of hypotension during general anesthesia: a single-center study at a university hospital. JA Clin Rep. 2023;9(1):23.
- 2. Ristovic V, de Roock S, Mesana TG, van Diepen S, Sun LY. The Impact of Preoperative Risk on the Association between Hypotension and Mortality after Cardiac Surgery: An Observational Study. J Clin Med. 2020;9(7):2057.
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32AP03-10

Quantifying ventricular synchrony and diastolic function to predict patients who will develop pharmacological induced myocardial ischaemia in a diagnostic setting

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Background and Goal of Study: Many perioperative factors have vasodilating properties that can alter myocardial blood flow (MBF). In patients with underlying coronary artery disease, this can lead to unbalanced blood flow distribution across the myocardium and potentially trigger perioperative myocardial ischaemia. MBF changes under vasodilatory stimuli can be assessed using cardiovascular magnetic resonance (CMR) or nuclear imaging diagnostic stress tests.

However, few will undergo these expensive stress tests. Yet, most patients with a higher cardiovascular risk profile will have a preoperative non-stress cardiac imaging exam such as echocardiography or CMR to assess cardiac function at rest.

From both modalities, multiple advanced ventricular systolic and diastolic functional parameters can be quantified with strain. In a diagnostic setting with awake patients with suspected ischaemic heart disease, we investigated if modern strain parameters at rest provide insight into which patients are at risk for inducible myocardial ischaemia in the presence of pharmacological vasodilation

Materials and Methods: Patients (n=99) referred for a clinical CMR exam were prospectively recruited. Resting function images were measured for left ventricular ejection fraction and three longitudinal strain measurements: peak strain, mechanical dispersion and early diastolic strain rate. These were assessed for their association with inducible ischaemia defined as MBF<1.5mL/g/ min under hyperaemic stress (400µg regadenoson).

Results and Discussion: Inducible ischaemia was identified in 44% of the patients. Mechanical dispersion (contractile dyssynchrony) was able to best predict hypoperfusion (AUC=0.68, p<0.01), followed by early diastolic strain rate (AUC=0.65, p=0.01) and the systolic marker of peak strain (AUC=0.62, p=0.03).

Neither ejection fraction nor patient age could significantly predict inducible ischaemia (AUC=0.61, p=0.07 and AUC=0.58, p=0.18).

Conclusion: We demonstrate in awake patients with suspected cardiovascular disease that modern strain markers for quantifying ventricular contractile synchrony and diastolic function from cardiac images acquired at rest predicted the onset of myocardial ischaemia induced by pharmacological hyperaemia.

These measures can be acquired in standard exams with both CMR and echocardiography, and these insights could be helpful to enhance perioperative risk assessment to detect patients prone to hypoperfusion.

32AP03-11

Haemodynamic management of post-infarction ventricular septal defect in a diabetic patient: a diagnostic and therapeutic challenge

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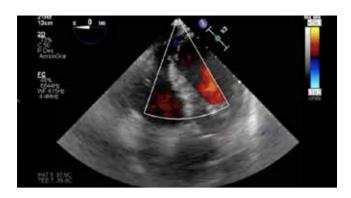
Background: Post-infarction ventricular septal defect (VSD) is a rare but serious mechanical complication of acute myocardial infarction (AMI), with a mortality rate above 60%. Surgical repair is the definitive treatment, though the optimal timing for intervention remains uncertain.

Case Report: A 64-year-old male with type 2 diabetes mellitus (T2DM) presented to the emergency department with a two-day history of abdominal and returned 48h later with acute pulmonary edema.

Echocardiography: mid-apical ventricular septal defect, and severely reduced left ventricular ejection fraction (LVEF). ECG: anterior-inferior STEMI. Given the extensive myocardial damage, revascularization was not possible, and an intra-aortic balloon pump (IABP) was placed for hemodynamic stabilization.

Two days later, the patient underwent surgical repair of the VSD. Preoperatively, he remained hemodynamically unstable, requiring dobutamine and levosimendan.

Advanced hemodynamic monitoring and cardiopulmonary bypass were used during surgery. The patient was transferred to the ICU, extubated 24 hours later, and gradually weaned from mechanical and inotropic support. He was discharged from the ICU on day six with a LVEF of 30%.



Discussion: VSD causes a left-to-right shunt, resulting in pulmonary volume and pressure overload and left-sided heart strain. The goal of management is to reduce the shunt by lowering afterload using devices such as IABP and vasodilators1.

Ventricular dysfunction often requires inotropes, and in severe cases, ventricular assist devices such as IMPELLA or VA-ECMO may be necessary. Surgical correction should ideally occur within seven days of VSD diagnosis to allow for myocardial stabilization and reduce myocardial friability.2

Diabetic patients often present atypically which delays diagnosis and increases the risk of complications.

References:

- 1. http://dx.doi.org/10.24875/recic.m22000334
- 2. http://dx.doi.org/10.1016/j.circv.2020.04.004

Learning points:

Management of VSD focuses on reducing the shunt through afterload reduction and improving contractility with inotropes and assist devices.

Delayed surgery after hemodynamic optimization offers the best outcomes.

32AP03-12

The dynamic optimal combinations of blood pressure and heart rate in critically ill patients: a time-dependent Cox proportional hazards model

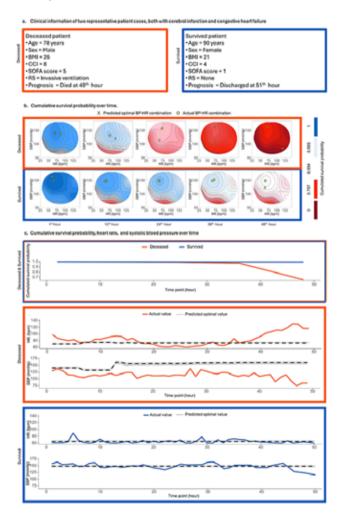
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Background and Study Objective: Prior research has identified associations among blood pressure (BP), heart rate (HR), and intensive care unit (ICU) mortality. However, these investigations primarily analyzed BP and HR as independent variables, without considering their dynamic interaction or temporal changes during the disease progression. This study aims to explore the dynamic association between BP-HR combination and mortality in ICU patients comprehensively.

Materials and Methods: We utilized the eICU database as the training set and the MIMIC-IV and Indiana University Health databases as validation sets. A time-dependent Cox Proportional Hazards model was employed to evaluate the association between

the dynamic BP-HR combination and ICU mortality. The analysis was adjusted for demographic characteristics, comorbidities, and dynamic data. Based on our model, we predicted the personalized optimal BP-HR combination throughout the ICU stay.

Results and Discussion: The study included 114,636 patients from eICU, 50,761 patients from MIMIC-IV, and 3,839 patients from Indiana University Health. The model on training and validation sets achieved C-indices of 0.931, 0.906, and 0.839, respectively. These findings diverged from studies that BP and HR were analyzed separately. The model results revealed that the relationship between the BP-HR combination and ICU mortality may differ among patients and could fluctuate within an individual patient over time. Our model therefore offered personalized dynamic predictions of the BP-HR combination for individual patients, identifying the optimal BP-HR values associated with the lowest risk of mortality.



Conclusion(s): Our findings indicate that patients with greater deviations between their actual and optimal BP-HR combinations are at a higher risk of adverse outcomes. Furthermore, our study demonstrated that an individual patient's clinical status may influence their tolerance to fluctuations in the BP-HR combination. Overall, the predictions generated by our model offer dynamic and personalized clinical guidance, tailored to varying hemodynamic conditions, for the effective management of ICU patients.

32AP04-1

A comparison of European and non-European anaesthesiology practice for using cardiac troponins to monitor perioperative myocardial injury

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Background and Goal of Study: Perioperative myocardial injury (PMI) is a known complication of major non-cardiac surgery. Typically, PMI is monitored by cardiac troponins (cTn). However, a variety of recent guidelines and recommendations differ on the need for and frequency of cTn.

Therefore, we aimed to assess the current trends of anaesthesiologists for using cTn to monitor PMI, and to compare if this practice differed between Europeans and non-European anaesthesiologists.

Materials and Methods: An international survey was distributed through anaesthesia societies and departments. Anaesthesiologists were asked if and how they use cTn to monitor PMI, and if they used dabigatran as treatment.

Results and Discussion: From an interim analysis of 189 responses, 68% were Europeans, 23% were non-Europeans, and 9% were undefined. When asked if they measure cTn to detect PMI in patients with a higher cardiovascular risk, not one anaesthesiologist (0%) answered "almost always", while 28% answered "usually", 42% "sometimes", 21% "rarely", and 9% "never".

Specifically, non-Europeans more frequently answered that they never monitor cTn in comparison to Europeans (21% vs 6%, p=0.05).

When cTn monitoring was used, 48% responded their most common trend was to measure cTn at three defined timepoints of 1) preoperative, 2) 24h postoperative and 3) 48h postoperative), while 6% indicated they apply routine sampling but at different timepoints, and 33% stated to measure cTn when the patient was symptomatic.

European's most common trend (56%) was the option to acquire cTn at the predefined timepoints corresponding to the 2022 ESC/ESAIC recommendations, while non-Europeans most commonly sampled cTn when patients were symptomatic (37%). When cTn monitoring was not used, non-European anaesthetists more often cited follow-up (33% vs 16%, p<0.01) or financial issues (28% vs 13%, p=0.03) than Europeans as the reason.

If PMI was detected, 3% answered they routinely use dabigatran as a treatment plan to improve patient outcome, 14% in select cases, while most (72%) do not. While rare, non-Europeans are more likely than Europeans (6% vs 2%, p=0.02) to routinely use dabigatran to treat complications from PMI.

Conclusion(s): There is currently a wide variation in the practice of anaesthesiologists concerning cTn surveillance practices for PMI. This underscoring a need for harmonized guidelines and enhanced awareness of evidence-based strategies to optimize PMI detection worldwide.

32AP04-3

A prospective comparison of ultrasound-guided brachial and radial arterial cannulation in patients undergoing cardiac surgery

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Background: Using the right radial artery for invasive blood pressure monitoring in patients undergoing cardiothoracic surgery is common practice. However, using the punctured right radial artery after angiography for invasive blood pressure monitoring has potential limitations, such as vasoconstriction and blood flow changes, which can affect the accuracy of arterial pressure read-

It forces us to perform an additional arterial line cannulation in one of the femoral arteries. It is also important to note if it happens, especially during the critical part of the surgery, while weaning off the cardiopulmonary bypass machine. These significant findings raise the question: can we trust radial artery pressure monitoring during cardiac surgery?

Methods: We recruited adult patients who underwent cardiothoracic procedures, such as coronary artery bypass graft surgery (CABG) and aortic, mitral, and tricuspid valve replacements (AVR, MVR, TVR), and randomly divided them into 2 groups. Group A included patients undergoing arterial cannulation of the right brachial artery, and Group B included patients undergoing arterial cannulation of the right radial artery. Then, we assessed the need for an alternative approach-femoral artery cannulation.

Results: The Chi-Square test was applied to statistically analyze categorical data. There is a significant difference between brachial and radial approaches, p-value = 0.012

Discussion: According to the data, the right brachial artery approach is superior to the right radial artery cannulation as a routine practice during cardiac surgery. In this study, there was less need for an alternative access-femoral artery cannulation.

Conclusion: We propose that brachial cannulation is a legitimate. less complicated, and reliable approach in patients undergoing cardiac surgery.

32AP04-4

Sudden cardiac arrest due to ventricular fibrillation as the initial presentation of mitral valve fibrosis: a case report

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Background: Mitral valve fibrosis, though rare, can cause sudden cardiac arrest (SCA) due to ventricular fibrillation (VF). This case highlights diagnostic challenges in a male with mitral fibrosis and SCA. Mitral valve prolapse (MVP) affects 2-3% of the population: mostly benign but malignant form, which involves mitral annular disjunction, bivalvular prolapse and fibrosis is linked to arrhythmias and sudden cardiac death (SCD). Identifying patients at risk requires clinical, electrophysiological and advanced imaging stud-

Case Report: A 52-year-old male without significant medical history was brought to hospital after being resuscitated from VF. Initial ECG and coronary angiography ruled out acute coronary syndrome.

Echocardiography showed chronic mitral regurgitation due to anterior MVP, with preserved left ventricular ejection fraction. Cardiac MRI confirmed MVP with inferolateral annular disjunction and significant fibrosis.

Therefore, he underwent mitral valve repair with annuloplasty and two neochords. The surgery was uneventful, requiring low doses of dobutamine and norepinephrine due to transient left ventricular dysfunction. He was discharged from ICU after 6 days.

Discussion: Mitral valve fibrosis and severe mitral regurgitation require multidisciplinary approach, combining surgical and nonsurgical options. Mitral valve repair is preferred but has a recurrence rate of 10-15% after 5 years, especially in severe mitral prolapse or advanced fibrosis. When repairing is not feasible, valve replacement is needed, with about 30% of patients with degenerative mitral insufficiency requiring it.

Minimally invasive techniques, like thoracoscopic surgery and transcatheter mitral valve replacement offer promising outcomes for high-risk patients for traditional surgery.

For non-surgical candidates antiarrhythmic drugs can manage atrial fibrillation and biventricular pacemakers may improve heart function in refractory cases. Implantable cardioverter-defibrillators (ICDs) are essential for primary prevention of SCD in at-risk patients.

Reference:

Singh M, Pal Y, et al. Fibrotic mitral valve disease and its role in sudden cardiac death. Heart. 2020;106(10):752-758.

Learning points:

- SCA can be the first sign of mitral valve fibrosis
- Cardiac MRI is essential for evaluating fibrosis
- ICD implantation is crucial for primary prevention of SCD
- Risk stratification for malignant MVP requires a combination of imaging and electrophysiological studies

32AP04-5

Perioperative clinical characteristics of pulmonary valve replacement for adult congenital heart diseases patients: single-centre retrospective research

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Background and Goal of Study: Pulmonary valve dysfunction and right ventricular failure are common long-term postoperative complications in adult congenital heart disease (ACHD) patients. Surgical pulmonary valve replacement (PVR) is the standard operation, though, the surgical induction differs. The differences in the perioperative clinical course of PVR depending on pathophysiological features remains unclear.

The primary aim of this study is to examine the perioperative characteristics of PVR surgery for ACHD patients, classified according to the types of valvular dysfunction.

Materials and Methods: A retrospective chart review was performed of PVR for ACHD patients between January 2021 and December 2023. The patients were classified into three groups: pulmonary stenosis (PS), pulmonary regurgitation (PR), and pulmonary stenosis and regurgitation (PSR). PS and PR were defined by the results of transthoracic echocardiogram. Statistical analysis included descriptive statistics and logistic regression.

Results and Discussion: 51 cases were analysed. The number of PS. PR and PSR patients were 11, 23 and 17 respectively. In preoperative parameters, cardiac magnetic resonance imaging indicated PR patients have larger right ventricular end-diastolic volume index compared to PS patients (p<0.001).

Systolic right ventricular pressure by the catheterization of PS and PSR patients were higher (p<0.001). As intraoperative features, cardiopulmonary bypass time and Aorta clamp time were longer for PS and PSR patients. PS patients were administered higher dose of dobutamine compared to PR patients intraoperatively (p<0.02). PS patients remained in the ICU longer than PR patients after the surgery (p<0.05).

Postoperative Nitric Oxide inhalation duration was longer for PS and PSR patients than PR patients (p<0.01). There was no significant difference in postoperative duration of mechanical ventilation, post-extubated respiratory support, inotropic agents' administration and hospitalization.

The different types of valvular dysfunction lead different mechanisms of right ventricular heart failure. The results of perioperative management and clinical courses in this study might have reflected the different pathophysiological features of right ventricular failure as the types of valvular dysfunction.

Conclusions: The pathophysiological difference of valvular dysfunction for PVR of ACHD patients might be an index for the perioperative clinical course and inotropic management.

32AP04-6

Prompt Diagnosis of Cardiac Tamponade in Type A Acute Aortic Dissection (AAD) Using Transesophageal Echocardiography (TEE): A Case Report

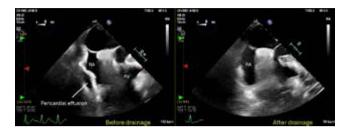
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Background: Type A AAD is a surgical emergency and can be fatal if anatomic-related complications are not early detected. It is essential to distinguish between the potential causes of shock in this emergent situation.

Case Report: This 57-year-old male, weighing 136 kg (BMI 55.9 kg/m²), with a history of hypertension presented to emergency department complaining of acute onset of blacking out and chest pain prior to visit. On examination, he was hypotensive, hypoxemic, and tachypneic. EKG showed junctional bradycardia. Contrast-enhanced CT angiography revealed type A aortic dissection from aortic root to bilateral external iliac arteries; no coronary artery involvement or pericardial effusion was identified.

He was brought to operation room for emergent repair. In OR, shock with tachycardia was noted under norepinephrine infusion. Vigilant induction with endotracheal intubation under careful dosing of fentanyl, succinylcholine, and etomidate was performed. Elevated jugular venous pressure (33 cmH₂O) was noted.

We placed a TEE probe to survey extent of dissection and causes for hemodynamic instability. Large pericardial effusion was found, along with diastolic collapse of right atrium (RA) and right ventricle (RV). A diagnosis of cardiac tamponade was made. No regional wall motion abnormalities or significant AR was found. After surgical drainage of pericardial effusion, his CVP returned to normal range and tachycardia improved.



Discussion: TEE has been reported to help clarify the etiology of shock. For those with preoperative exam yielding proximal ascending aortic dissection with no definite etiology of shock, early utilization of TEE has therapeutic impact. Acute pericardial effusion can occur and cause cardiac tamponade if proximal portion of ascending aortic dissection ruptures into the pericardium.

Reference:

Prager et al. Indications, Clinical Impact, and Complications of Critical Care Transesophageal Echocardiography: A Scoping Review. J Intensive Care Med. (2023)

Learning points: Intraoperative TEE can facilitate appropriate surgical plan by promptly identifying life-threatening conditions in type A AAD with proximal aortic root involvement.

32AP04-8

ExtraCorporeal life support versus IMPELLA® pump as Bridge to Left ventricular **Assist Device (ECI-BLAD trial)**

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Background and Goal of Study: Among patients treated by temporary mechanical circulatory support (tMCS) for refractory cardiogenic shock (rCS), some of them suffer from persistent cardiac dysfunction incompatible with a successful weaning [1]. In eligible patients, the heart transplantation is still the gold standard therapy. In the other, the left ventricular assist device (LVAD) represents an alternative therapy.

However, the best approach of tMCS as a bridge to durable LVAD remains to be defined. IMPELLA implantation through axillary approach allows early rehabilitation [2].

Conversely, femoral veno-arterial ECMO limit considerably the possibility of early mobilization even if ventilatory weaning remains possible. We tested the hypothesis that the use of IMPEL-LA® pump as bridge to LVAD, by allowing active rehabilitation, may improve patient's postoperative outcomes.

Materials and Methods: This muticenter retrospective study included adult patients, supported with IMPELLA® or VA-ECMO as a bridge to LVAD between 01/2012 and 03/2020 in 5 French cardiac intensive care units. IMPELLA group included patients exclusively treated by this device within the week prior to LVAD implantation whereas ECLS group included patient treated by ECLS associated or not to IMPELLA. The primary endpoint was the proportion of patients alive with a John Hopkins Highest Level of Mobility score = 8, out of critical care unit and not perfused at 30 days after LVAD implantation. Secondary endpoints included mobilization under tMCS, SOFA score and 6-month mortality. This study was approved by our ethics committee and registered on clinicaltrials (NCT04480151).

Results and Discussion: During the study period, 388 consecutive patients were implanted by LVAD. Among them, 92 patients under STMCS as bridge to LVAD were analyzed (IMPELLA group, n=48/ECLS group, n=44). Early mobilization on tMCS was more frequently achieved in IMPELLA group (seating 53% vs 5% and walking 20% vs 0%, p<0.01). The SOFA score was lower in IM-PELLA group the day of LVAD implantation (4 [3-7] versus 8 [5-10], p<0.01). More patients reached the primary endpoint in IM-PELLA group (54% vs 25%, p<0.01). The 6-month mortality rate was lower in IMPELLA group (19% vs, 39%, p=0.04).

Conclusion: IMPELLA as bridge to LVAD by allowing early mobilization may be associated with better outcomes in patients.

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32AP04-9

Postinduction blood pressure trajectories: clustering and predictive modeling using machine learning

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Background and Goal of Study: Induction of general anaesthesia (GA) often leads to significant blood pressure (BP) fluctuations, posing risks for perioperative complications. Current management strategies are reactive and fail to address the variability in BP responses.

This study aimed to identify distinct BP trajectories after GA induction and develop a machine learning (ML) model to predict these patterns.

Materials and Methods: This retrospective cohort study analysed data from 17,645 patients undergoing non-cardiac, non-obstetric surgery under GA. Blood pressure trajectories were identified using X-means clustering of mean arterial pressure (MAP) measurements within the first 10 minutes post-induction. A predictive model combining XGBoost and K-nearest neighbours (KNN) algorithms was developed to classify patients into trajectory groups based on preoperative and intraoperative variables.

Results and Discussion: A total of 17,645 patients were included in the final analysis. The median patient age was 48.3 years (IQR 34.2-68.0). The study included 9.437 men (53.5%) and 8.208 women (46.5%). The majority of patients had ASA-PS class II or III [6,233 (35.3%) and 6,789 (38.5%)], respectively. Of the total cohort, 14,720 (83,4%) patients underwent elective surgery. Five unique BP trajectories were identified:

Steady Staters (5618 patients, 31.8%) - with an initial MAP decrease but stable BP maintenance around the 80s:

Abrupt Decliners (5218 patients, 29.6%) - demonstrating the most significant BP drop, averaging 40 mmHg lower post-induc-

Gradual Decliners (3243 patients, 18.4%) - exhibiting a steady decline, often from higher pre-induction MAP;

Gradual Risers (1330 patients, 7.5%) - showing an initial MAP drop followed by a gradual recovery; and,

Low Steady-Starters (2236 patients, 12.7%) - with initially low BP and limited recovery post-induction. Our predictive model achieved an area under the curve (AUC) of 0.799, testing accuracy of 0.79, precision of 0.69, recall of 0.80, and F1 score of 0.74, demonstrating strong predictive capability.

Conclusion(s): This study demonstrates the feasibility of using ML to predict individual BP responses to anesthesia induction. The results pave the way for proactive and tailored hemodynamic management strategies, potentially improving patient outcomes.

32AP04-10

Developing the isometric handgrip exercise as a potential preoperative imaging test to quantify the impact of blood pressure changes on whole heart function

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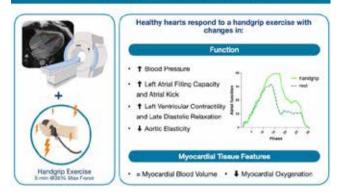
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Background and Goal of Study: Haemodynamic fluctuations during anaesthesia can unmask cardiovascular dysfunction and are a significant contributor to perioperative ischaemia and heart failure. Anaesthetists rely on findings from diagnostic imaging stress tests to identify patients at risk. However, these stress agents have minimal influence on blood pressure. The isometric handgrip exercise is known to increase blood pressure. In awake healthy controls, we investigated the influence of an isometric handgrip exercise on whole heart function and tissue features to determine if there is potential for it to be a haemodynamic stress test.

Materials and Methods: Healthy volunteers (n=31) underwent a cardiovascular magnetic resonance exam where images were acquired before and during a handgrip exercise. Participants squeezed a dynamometer continuously at 30% of their maximum grip force (3-5min). Changes in myocardial blood volume (T1 maps) and oxygenation were measured. Functional images of the aorta, left atrium and ventricle were quantified with strain and long-axis shortening.

Results and Discussion: The handgrip exercise elevated systolic and diastolic blood pressure (106±10 to 120±13mmHg and 62±10 to 78±12mmHg, p<0.01), resulting in a reduced aortic elasticity (30.0±11.3 to 25.3±9.8%, p<0.01). Systolic function increased, marked by a rise in atrial filling (35.3±6.0 to 39.1±8.2, p<0.01) and ventricular contraction (-17.9±2.3, to -19.6±3.1, p<0.01). While there was no change in early diastolic function, late diastolic function increased with a rise in the atrial kick (11.5 \pm 4.5 to 14.6 \pm 5.3, p=0.02) and ventricular late relaxation (4.0±2.4 to 5.3±1.7, p=0.02). There was no increase in myocardial blood volume despite the higher workload (T1: 1188±26ms to 1193±24ms, p=0.47), and myocardial oxygenation dropped by 3.6±5.5% (p<0.01).

In combination with cardiovascular imaging, an isometric handgrip exercise has the potential to be a haemodynamic stress test to assess the impact of blood pressure changes on the heart.



Conclusion(s): A handgrip exercise significantly increased blood pressure resulting in changes to myocardial oxygenation and aortic, atrial and ventricular function. It can now be investigated as a potential tool to identify patients susceptible to cardiovascular dysfunction during perioperative haemodynamic fluctuations.

32AP04-12

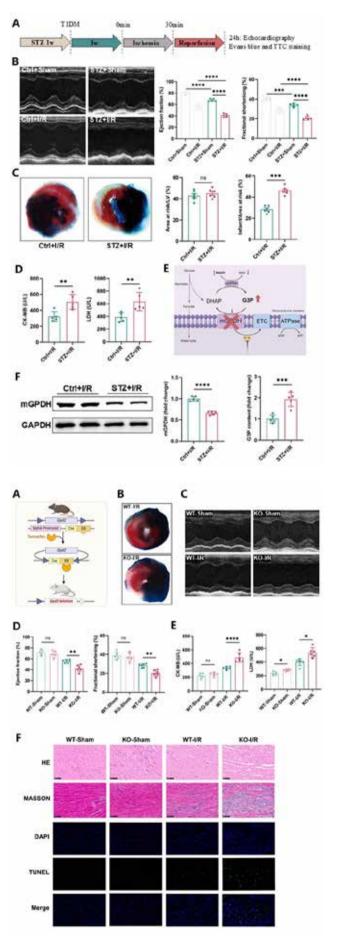
Glycerol 3-phosphate dehydrogenase deficiency sensitizes the diabetic heart to ischemia-reperfusion injury by promoting mitochondrial dysfunction

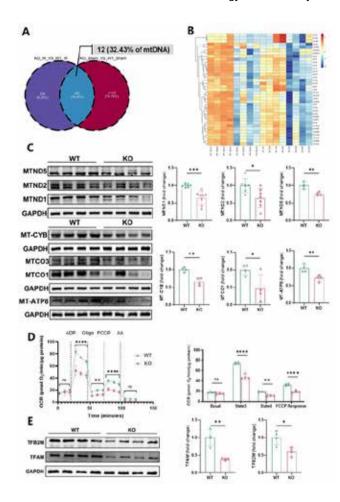
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Background and Goal of Study: Myocardial ischemia-reperfusion (I/R) injury causes cardiac dysfunction and the progression of diabetes increases the susceptibility to I/R injury. We previously found that mitochondrial glycerol 3-phosphate dehydrogenase (mGPDH) expression was downregulated in diabetic mice. This study aimed to characterize the role of mGPDH in mediating I/R injury sensitization and mitochondrial dysfunction.

Materials and Methods: In STZ-induced diabetic mice, the myocardial I/R injury model was established by ligation of the left anterior descending coronary artery. To discover the key molecular mechanism involved in I/R injury by cardiomyocyte deletion of mGPDH, we performed the RNA-Seq study.

Results and Discussion: We found that cardiac functional was significantly exacerbated s and mGPDH expression was reduced in the diabetic heart (Figure 1). Next, we established cardiomyocyte-specific mGPDH knockout mice. We observed that IR-induced cardiac contractile dysfunction and structural damage was aggravated in GPD2 KO mice (Figure 2).





RNA sequencing revealed mitochondrial genome transcription was inhibited, resulting in downregulation of essential subunits of mitochondrial ETC complexes in mGPDH KO groups. Further, we found that expression of TFAM and TFB2M were dramatically down-regulated in mGPDH KO mice (Figure 3).

Conclusion(s): These results suggest that mGPDH deficiency aggravate diabetic myocardial I/R injury and mitochondrial dysfunction via inhibiting transcription of mitochondrial DNA.

32AP05-1

Perioperative myocardial injury in vascular surgery patients: incidence and outcomes

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Background and Goal of Study: Patients with acute perioperative myocardial injury (PMI) have an increased risk of death and major adverse cardiovascular and cerebrovascular events (MAC-CE). Our aim was to investigate PMI in vascular surgery (VS) patients according to type of surgery and its effects in short and long-term morbidity and mortality.

Materials and Methods: Post-hoc analysis of the MINSMAR study, a prospective, single-center cohort study enrolling adults ≥45 years scheduled for intermediate and high-risk non-cardiac surgery. We analyzed PMI in open aortic surgery, iliac and infrainguinal bypass, supra and infracondylar amputation, carotid endarterectomy, endovascular repair of aortic aneurysm (EVAR) and peripheral angioplasty with anaesthesia. Baseline high-sensitivity troponin T (hsTnT), baseline N-Terminal Pro-B-Type Natriuretic Peptide (NT-proBNP) and hsTnT on the first 3 postoperative days were obtained.

PMI was defined by at least one hsTnT value ≥30ng/L provided there was a rise and/or fall of at least 20% of the baseline hsTnT concentration on the day of surgery or within the first three postoperative days. MACCE and mortality were registered at 30 days and 1 year after surgery.

Results and Discussion: Of 732 patients included, 247 (34%) underwent VS. Incidence of PMI in our risk population was 22%, of which 44% (71 patients) occurred in VS patients, mostly in men (81,7%). Distribution of PMI based on type of VS was: 39% iliac and infrainguinal bypass, 36% amputations, 23% carotid endarterectomy, 22% peripheral angioplasty, 20% aortic surgery and

Patients with PMI were older, had worse kidney function, lower haemoglobin levels, worse functional capacity, higher prevalence of heart failure and atrial fibrilation than those without PMI.

The prevalence of elevated basal NT-proBNP (≥300 pg/mL) was higher in patients with PMI than in those without PMI (66,2% vs. 31,8%; P <0,01) and elevated basal hsTnT (≥14 ng/L) was more frequent in patients with PMI (85,9% vs. 36,9%; P<0,01).

PMI was associated with a higher incidence of MACCE at 30 days and one year (14,5% vs 4%; p<0,01 and 24,1% vs 13%; p=0,06 respectively) and with 30 days and 1 year mortality (5,6% vs 1,1%; p<0.001 and 25.4% vs 7.4%: p<0.001).

Conclusion(s): PMI incidence in vascular surgery patients is high, especially in iliac and infrainguinal bypass surgery and major amputations. Patients with PMI have a much higher risk of MACCE and mortality in both the short and long term.

32AP05-2

High-flow nasal oxygenation during sedation for transcatheter aortic valve replacement: the **HIGH-OXY-TAVR** randomized-controlled trial

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Background and Goal of Study: Transcatheter aortic valve replacement (TAVR) performed under conscious sedation is the standard of practice for most of the patients. However, sedation to this population could produce hypoxia and hypercapnia that can aggravate hemodynamic disturbances during the procedure1. Data on the efficacy of high flow nasal oxygenation (HFNO) in TAVR is inconclusive².

This study aims to asses HFNO benefit in hypoxia prevention and to explore an impact on any organ injury.

Materials and Methods: The HIGH-OXY-TAVR investigator-initiated, controlled trial, randomised patients requiring transfemoral TAVR 1:1 to the use of HFNO (flow rate of 50 L/min and FiO2 0.6) vs conventional oxygenation (via dry nasal specs).

The primary endpoint was the number of desaturation episodes defined as Sp02 <93% for more than 10 seconds. Secondary outcomes included changes in arterial partial pressure of oxygen (pO2) at 45 minutes. Serological biomarkers including neuronal specific enolase (NSE), creatinine (Cr), troponine (hs-CTnI) and NT-proBNP were registered before starting the procedure and 8 hours after.

Results and Discussion: 125 patients (64 in Intervention Group [IG] and 61 in Control Group [CG]) were rendered. Baseline characteristics were comparable between 2 groups. The number of desaturation episodes was superior in CG compared to IG (mean of 1.8 and 0.8 p<0.05) despite higher doses of propofol being used in IG than CG (174.06 mg and 147.57 mg p<0.05). Moreover, desaturation happened in 31 individuals (50.8%) in CG compared to 13 (20.3%) in IG (p< 0.005), relative risk reduction 0.39 (95% IC 0.23-0.68).

Multivariate regression model showed patients with BMI>30kg/ m2 to be at higher risk of desaturation (p<0.05). In contrast, HFNO patients were at a lower risk of desaturation (p<0.001) (Figure 1). Mean glomerular filtrate showed a significantly higher increase in the IG from baseline to 8 hours (+5±2.5 ml/min vs. -1.9±2.5 ml/min; p<0.05) while serum creatinine showed a significant decrease in the IG (-0.08mg/dl vs. +0.06mg/dl), reflecting an improvement in postoperative kidney function in HFNO group (Figure 2).

Conclusion(s): This study has demonstrated that HFNO provides a superior oxygenation profile compared to standard oxygen therapy, specially in obese patients. The possible beneficial effects on end-organ function will need to be confirmed on larger studies.

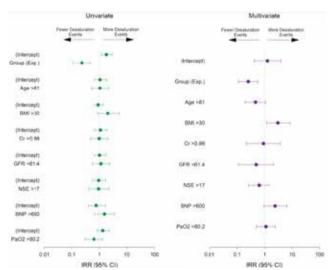


Figure 1:

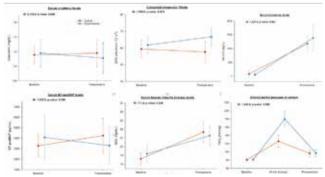


Figure 2:

References:

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- 2. Scheuermann S. et al. High-Flow Nasal Oxygen Vs. Standard Oxygen Therapy for Patients Undergoing Transcatheter Aortic Valve Replacement With Conscious Sedation. Perioper Med (Lond). 2023 Apr 14;12(1):11

32AP05-3

Perioperative venous doppler as an indicator of systemic congestion in cardiac surgery patients

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Background and Goal of Study: Systemic venous congestion is a critical factor in adverse outcomes following cardiac surgery and traditional markers often fall short in predicting complications (1). Doppler ultrasound patterns and scoring systems assess venous congestion at various levels but face limitations (2), including interference from abdominal and pleural pressures, technical challenges, and limited studies comparing preoperative and postoperative changes (3).

This study evaluates the predictive value of perioperative Doppler parameters and their correlation with complications.

Materials and Methods: A prospective, observational study was conducted, including 18 cardiac surgery patients at Hospital La Fe, Valencia (May-December 2024). Preoperative echocardiography and venous flow analysis were performed for the internal jugular vein, inferior vena cava and portal vein. Respiratory-cycle diameters were measured and collapsibility indices calculated. Postoperative evaluations were done at admission to the critical area unit and at 12, 24, 48 hours. Biomarkers (lactate, NT-proBNP, troponins, nephrocheck, CA-125) were measured at the same intervals. The study was approved by the Ethical Research Committee at our centre. Statistical analysis was performed using IBM® SPSS® Statistics.

Results and Discussion: It is analysed 18 cardiac surgery patients (mean age 64.6 ± 10.1 years; 61.1% male). Hypertension (77.8%) and dyslipidaemia (61.1%) were the most common comorbidities. The median EUROSCORE II was 1.64 (IQR 1.27), indicating a lowrisk population. Preoperatively, 55.6% were classified as VExUS grade 1. At 48 hours, 38.9% had progressed to grades 2-3, indicating worsening systemic congestion in a subset of patients. Higher biomarker levels coincided with these congestion patterns, warranting further investigation. This pilot study highlights Doppler ultrasound's utility in perioperative risk assessment, but larger samples are needed to validate these findings and refine its integration into clinical application.

Conclusion: Initial data support the hypothesis that Doppler ultrasound parameters may be associated with postoperative outcomes. Ongoing analysis would further validate these findings in larger cohorts and refine their integration into perioperative protocols.

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Echogenicity of the basal septum increases after surgery and aortic declamping at cardiopulmonary bypass as a possible sign of micro air bubble embolism

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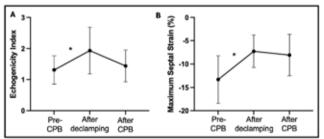
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Background: Micro air bubbles can occasionally enter the circulation during cardiac surgeries using a cardiopulmonary bypass (CPB). This can lead to ischemia in the affected myocardium, impairing function and potentially complicating separation from CPB. The right coronary artery, which supplies the septum, inferior wall and right ventricle, is considered the most at risk for micro air embolism due to its orifice being positioned at the highest point of the aorta cross section in a supine patient. Since air bubbles reflect ultrasound waves, myocardial territories impacted by micro air embolism appear brighter on transoesophageal echocardiography (TOE).

In this study we examine the echogenicity of the basal septum and assess septal strain depression as an indicator of impaired septal systolic function.

Methods: In this retrospective study, interim analysis includes 56 patients who underwent cardiac surgery on CPB. In TOE images that were routinely obtained during surgery, we determined the echogenicity index (echogenicity of the basal septum divided by echogenicity of the lateral wall) and the maximum septal strain before initiation of CPB, after declamping of the aorta, and after the end of CPB.

Results: Echogenicity index increased from 1.3±0.46 at baseline to 1.9±0.75 (p=0.02) after declamping of the aorta, indicating an exalted echogenicity of the basal septum. After CPB, the echogenicity index returned to baseline (1.4±0.5, p=0.32). In the same patients, maximum septal strain worsened from -13.3±5.1 at baseline to -7.3±3.5 (p<0.01) after declamping, after decannulation from CPB it stayed reduced at -8.1±0.7 (p=0.52).



A: Echogenicity index at the three timepoints. B: Maximum septal strain at the three time pints, a more negative value indicates a better strain. CPB, cardiopulmonary bypass. *p<0.05 between timepoints.

Conclusion: After aortic declamping during CPB, echogenicity of the basal septum exceeds that of the lateral wall compared to baseline. This is likely caused by an increase of micro air bubbles in the regional microcirculation of the right coronary artery. In the same segments a worsening in maximum septal strain was observed. After CPB, echogenicity returned to baseline, potentially indicating the wash out of air bubbles. Ongoing analysis will further investigate whether echogenicity and strain measurements are associated with weaning outcomes.

32AP05-6

Anesthetic management of trans-apical ablation for ventricular tachycardia in a patient with a history of valvular surgery: a case report

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Background: When antiarrhythmic drugs are ineffective, catheter ablation is the only treatment for ventricular tachycardia (VT). Management of catheter ablation for patients who underwent valvular surgery is not established.

Case Report: The patient is a 48-year-old man with the subcutaneous implantable cardioverter defibrillator (S-ICD) for VT. who had undergone aortic and mitral valve replacement with both mechanical valves and tricuspid annuloplasty 24 years ago. Recurrent slow VT led to frequent discharge of the S-ICD, and VT ablation was indicated.

As the endovascular approach to the left ventricle was expected to be difficult due to mechanical prosthetic valves, we planned endocardium and epicardium ablation via anterolateral submammary thoracotomy.

The procedure was performed under general anesthesia with sevoflurane, remifentanil, and fentanyl. A double-lumen endotracheal tube was inserted for one-lung ventilation. During the mapping, VT was induced for 205 minutes.

We administered noradrenaline for hemodynamic stability. An autologous blood salvage system was used to reduce blood transfusion. During the procedure, we checked lactate, central venous oxygen saturation, and cerebral regional oxygen saturation as a monitor of organ perfusion, and transesophageal echocardiography (TEE) was used for detecting cardiac tamponade.

Although the procedure was incomplete because of the extensive adhesion, no complications were observed intraoperatively.

Discussion: Anesthetic drugs that minimally affect arrhythmia induction should be used during ablation. Particularly for transapical ablation in patients who underwent cardiac surgery, heart team members should share the risk of life-threatening complications, such as damaging the apical structures, bleeding from the apex¹⁾, and acute ischemia from coronary vasospasm.

Monitoring of oxygen supply-demand balance and TEE could contribute to optimize hemodynamics and diagnosis of complications. Mechanical support should be prepared in case of circulatory collapse²⁾.

References:

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- Learning Points: Optimal anesthetic management of VT ablation requires understanding the effects of anesthetic drugs on arrhythmia, procedural technique, and its complications. Maintaining hemodynamic stability, monitoring for adequate organ perfusion, and early detection of complications are essential.

Influence of cardiopulmonary bypass on perioperative plasma and interstitial cefuroxime concentrations in patients undergoing cardiac bypass surgery - a controlled clinical trial

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Background and Goal of Study: Cardiopulmonary bypass (CBP) can significantly alter the pharmacokinetics (PK) of surgical antimicrobial prophylaxis due to factors such as hemodilution, interactions with the extracorporeal circuit, altered protein binding. impaired renal function, and inflammatory responses.

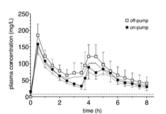
This controlled, prospective, single-center study aimed to investigate cefuroxime plasma and interstitial fluid (ISF) concentrations in patients undergoing elective coronary artery bypass graft (CABG) surgery.

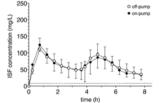
Materials and Methods: Ethical approval was granted by the Ludwig-Maximilian University of Munich (23-0076). All patients undergoing either on- or off-pump cardiac bypass surgery received a total of 4,5g cefuroxime. ISF concentrations were measured by placing two microdialysis probes into the subcutaneous tissue of both upper arms. Plasma and ISF concentrations were determined up to 8h after administering the first dose.

The primary endpoint was the area under the concentration-time curve (AUC_{0-8h}) in the plasma and ISF. PK analysis was performed by non-compartmental analysis.

Results and Discussion: 15 patients undergoing on-pump and 15 patients undergoing off-pump CABG were enrolled from 06/2023 to 04/2024. The mean age was 67±12 years, and the mean BMI was 28.1±5.0 kg/m². Baseline characteristics, cardiovascular risk profile, and preexisting comorbidities were similar in both groups. The mean surgical duration was 262±52min in the on-pump and 193±38min in the off-pump group, the mean bypass time was 97±26min.

There was no significant difference in plasma concentrations (mean AUC_{0-8h} \pm SD: 490.7 \pm 271.9 vs 650.0 \pm 36.4h·mg/L, p=0.072) or ISF concentrations (488.4±211.7 vs 507.7±209.0 h·mg/L, p=0.824) between the groups.





Conclusion(s): Plasma and ISF concentrations in all patients undergoing CABG on CBP exceeded the relevant minimum inhibitory concentrations (MIC) of pathogens associated with postoperative sternal wound infections (T>MIC=100% for E. coli and S. aureus at 4 and 8mg/L).

There is currently no need for cefuroxime dosing adjustments for surgical antibiotic prophylaxis in patients undergoing CABG with a mean CBP duration of 97 minutes.

32AP05-8

Early extubation after minimally invasive direct coronary artery bypass graft-the future becomes the present

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Background: Minimally invasive direct coronary artery bypass graft surgery is surgical technique performed in patients with isolated disease of left anterior descending artery.

Case Report: A 59-old-male patient was hospitalized because of persisting symptom chest pain with present ST elevation in electrocardiography reading. Coronary angiography procedure showed left anterior descending artery disease. The patient was prepared for minimally invasive direct coronary artery bypass graft surgery procedure (MIDCAB). Total intravenous anesthesia was used to induce and maintain general anesthesia. Single lung ventilation was used to collapse left lung to facilitate visualization and harvesting of internal mammary artery.

After finishing surgical procedure, patient is awakened and extubated in operating room. After 4 days patient was discharged from hospital.

Discussion: Rapid development of minimally invasive surgery provides developing of standard cardiac anesthetic techniques which allow early awakening and extubation (1).

Perioperative using of total intravenous and epidural anesthesia provide good pain control and postoperative haemodynamic stability (2).

Immediate postoperative awakening, extubation and mobilization of patient allow MIDCAB procedures to become non-intensive care surgery like percutaneous transluminal coronary angioplasty or stent grafting (3). Early discharging from hospital allows better organization of hospital resources, personnel and reduces surgical waiting lists.

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Learning Points: Development of minimally invasive surgery should be followed by new anesthetic approaches promoting rapid postoperative recovery in patients undergoing minimally invasive cardiac surgery. Perioperative using of total intravenous and epidural anesthesia and immediate postoperative awakening, extubation and mobilization of patient allow MIDCAB procedures to become non-intensive care surgery.

Tailored anesthetic strategies in fontan physiology: continuous spinal block as a safe option

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Background: Patients with Fontan circulation present unique anesthetic challenges due to their non-standard hemodynamics. This case describes the use of continuous spinal anesthesia (CSA) in a patient with Fontan circulation, highlighting a tailored anesthetic approach that avoided hemodynamic instability.

Case Report: 40-year-old woman, ASA IV, 52Kg and 162cm, with a univentricular heart and Fontan circulation, was admitted for management of distal femur osteomyelitis complicated by septic shock. Following initial surgical debridement, she required stabilization in intensive care.

For a subsequent procedure (placement of an external fixator) CSA was employed to minimize hemodynamic fluctuations. Preoperatively, the patient was normotensive (septic shock resolved) and eupneic but presented with ascites and lower limb edema. Laboratory findings showed anemia, normal renal function and controlled inflammatory markers. CSA was achieved using fractionated boluses of 1.25mg bupivacaine (total 7mg) combined with 2.5mcg sufentanil. The procedure was conducted under sedation with midazolam and fentanyl, without vasopressor support. Hemodynamic stability was maintained throughout surgery (lowest MAP 74mmHg). Postoperatively, the patient remained stable, facilitating transfer back to the orthopedic ward within 24hours.

Discussion: The increasing survival rates of Fontan patients into adulthood demand advanced anesthetic strategies tailored to their unique physiology.

General anesthesia in these patients increases the risk of elevated pulmonary vascular resistance and venous congestion, potentially leading to hemodynamic collapse.

Regional anaesthesia is considered the preferred anaesthetic technique for these patients because it is the least likely to interfere with pulmonary vascular resistance and ventricular function. In this case, CSA allowed precise titration of local anesthetic, avoiding the systemic vasodilation and myocardial depression associated with general anesthesia, demonstrating its feasibility and safety in carefully selected scenarios.

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Learning points:

- 1. CSA is a viable alternative for Fontan patients, minimizing hemodynamic perturbations.
- Precise anesthetic titration and close hemodynamic monitoring are essential for perioperative stability.

32AP05-10

Effects of exosomes on the cardiac protection of volatile anesthetics

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Background and Goal of Study: Exosomes are membrane vesicles secreted from cells and play a role in transmitting information to cells and tissues. They are 30-150 nm in diameter and encapsulate proteins and nucleic acids. When exosomes are absorbed by cells, the proteins and nucleic acids in the exosomes act on and affect the cells.

However, there are no reports showing the involvement of exosomes in the myocardial protective effects of volatile anesthetics. Therefore, we investigated the effects of exosomes on the cardiac protection of volatile anesthetics.

Materials and Methods: Blood was collected from male C56BL6 mice, exosomes were extracted, and differences in blood exosomes were examined with and without volatile anesthetic exposure (1 MAC isoflurane for 30 min).

Next, hearts were retrograde perfused on a Langendorff apparatus and digested with collagenase. Isolated cardiac myocytes were then plated on laminin-coated dishes and were subjected to simulated ischemia-reperfusion (SI/R) using a special chamber. Myocytes were treated with isoflurane and/or GW4869, blockade of exosome generation, and the survival rates of myocytes were examined.

In addition, extracted blood exosomes were added to cultured myocytes to examine their effects on SI/R. All data are expressed as mean \pm SD.

Statistical analyses were performed by one-way ANOVA followed by Bonferroni test and statistical significance was defined as P<0.05.

Results: We investigated the expression of CD9 and HSP70 proteins, exosome-associated proteins, in blood extracted exosomes. Immunoblots revealed more expression of both CD9 and HSP70 by volatile anesthetics. Isolated adult cardiac myocytes were subjected to SI/R with and without isoflurane and/or GW4869 (n=5 per group).

Survival rates of myocytes decreased from 65.8 \pm 7.0% in the control group to 25.2 \pm 10.7% after SI/R, while isoflurane administration significantly increased the survival rates to 50.6 \pm 11.5% (vs SI/R).

Pre-administration of GW4869 abrogated the myocardial protective effects of isoflurane and reduced the survival rate to 33.2 \pm 13.5%. The addition of mouse blood-extracted exosomes resulted in a survival rate of 55.9 \pm 12.8%, and the myocardial protective effect was similar to that of isoflurane administration.

Conclusion: Our results suggest that exosomes released by volatile anesthetics were implicated in myocardial protection.

Anesthesia in the shadows of Brugada: safeguarding surgical patients at risk - a case

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Background: Brugada syndrome is a genetic cardiac disorder characterized by ST-segment elevation in right precordial leads. which increases the risk of sudden cardiac death.^{1,2}

Anesthetic management for patients with this syndrome poses unique challenges.

Case Report: We present a case involving a 36-year-old male with an unremarkable medical history who was diagnosed with acute cholecystitis, requiring laparoscopic cholecystectomy. Preoperative evaluations revealed a type 1 Brugada pattern on the EKG, although the patient reported no symptoms.

Notably, there was a family history of early mortality, with the patient's father having died at age 30 from an unknown cause.

A consult with cardiology recommended avoiding several medications that could exacerbate the Brugada pattern. In the operating room, the patient was monitored according to ASA standards, EKG 5 leads and multifunction pads were applied from the monitor-defibrillator for safety.

Anesthetic induction and orotracheal intubation proceeded without complications, utilizing fentanyl, propofol, and rocuronium, maintained with sevoflurane.

The surgical procedure and subsequent emergency management were uneventful. A post-procedural cardiology evaluation indicated no changes in the patient's condition, recommending outpatient follow-up.

Discussion: This case highlights the critical importance of thorough preoperative assessments and collaborative efforts between anesthesiology and cardiology when managing patients with Brugada syndrome. The careful selection of anesthetic agents and vigilant intraoperative monitoring are vital to mitigate the risk of arrhythmias. A comprehensive understanding of the Brugada pattern enables the development of tailored anesthetic protocols.

References:

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- 2. Dendramis G, Paleologo C, Sgarito G, Giordano U, Verlato R, Baranchuk A, et al. Anesthetic and Perioperative Management of Patients With Brugada Syndrome. Am J Cardiol. 2017;120: 1031-1036

Learning points: Anesthetic management of patients with Brugada syndrome requires meticulous attention to potential drug interactions and monitoring techniques. Early identification of the syndrome can promote interdisciplinary collaboration, enhancing patient safety during and after surgical procedures.

32AP05-12

Anesthetic management of a patient with patent ductus arteriosus and severe acute pancreatitis: a case report

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Background: A persistent ductus arteriosus (PDA) is a congenital heart defect in which the communication between the pulmonary artery trunk and the proximal descending aorta fails to close (1). It is more common in female and accounts for 6-11% of congenital heart diseases (CHD) (2).

Case Report: A 39-year-old woman, has a history of an uncorrected PDA (11x32 mm, Qs/Qp of 2.22), severe precapillary pulmonary hypertension, and heart failure. She presents with a diastolic murmur, acrocyanosis, emesis, and band-like abdominal pain. Abdominal CT shows severe acute necrohemorrhagic pancreatitis (Balthazar C) with 50% necrosis, Marshall 6, and APACHE 27 points. She was classified as ASA V, <4 MET and SOFA 7. An exploratory laparotomy was performed. Intraoperative TEE confirm a PDA with a left-to-right shunt, right ventricular hypertrophy and severe atrial dilation and severe pulmonary artery dilation.

There was significant hemodynamic instability with desaturation and elevated airway pressures, requiring norepinephrine, vasopressin, and milrinone. A right hemicolectomy, hemoperitoneum drainage, pancreatic necrosectomy, pancreatic cell packing were performed, and she was transferred to the ICU.

Discussion: Adults with PDA who undergo surgery pose an anesthetic challenge due to the impact of ventilation, oxygenation, and anesthesia on systemic and pulmonary blood flow. Patients are typically asymptomatic until the third decade of life, often presenting with compounded diseases (2).

In childhood, the management is either conservative (NSAIDs) or surgical (via catheter or open surgery). If not corrected, patients are at risk for heart failure, pulmonary hypertension, and endocarditis, the leading cause of death.

In adults undergoing surgery, it is crucial to avoid hypothermia, hemodilution, hypoxia, and hyperoxia. Monitoring SVR and PVR to regulate pulmonary blood flow. The latency of intravenous agents is prolonged, and the ventilatory goal it is a matter of debate (3).

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Learning Points: The number of adults with CHD is increasing, particularly with PDA. Patients are usually asymptomatic until they develop comorbidities, and when undergoing surgery, they present a challenge. It is crucial to be aware of the anatomy, cardiopulmonary changes, and the impact of anesthesia to improve outcomes and prevent complications.

32AP06-1

The effect of ketamine on neurocognitive disorders, depression and inflammatory biomarkers in cardiac surgical patients

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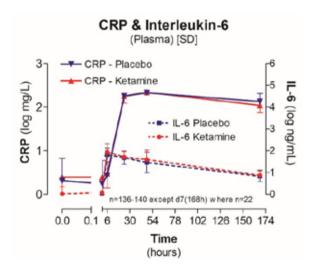
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Background & Goals: Cardiac surgery patients often experience postoperative cognitive and mood changes in a setting of a significant inflammatory response. Ketamine has been suggested to reduce delirium and depression, and to have anti-inflammatory effects.

We investigated if ketamine given during cardiac surgery decreased postoperative delirium (POD), delayed Neurocognitive Recovery (dNCR) and depression, and whether this was associated with an anti-inflammatory effect.

Materials & Methods: In a double-blind randomised controlled trial, with ethics committee approval and informed consent, cardiac surgical patients received either intravenous ketamine (0.5 mg kg⁻¹) or placebo at anaesthesia induction.

Assessments were done for cognition, delirium, and depression at baseline, and postoperatively to day 7. Serial plasma samples were collected to 48 h for inflammatory biomarkers (interleukin-6 (IL-6), IL-8, IL-10, tumour necrosis factor alpha (TNFα), and Creactive protein (CRP). In a convenience sample, d7 plasma was collected.



Results & Discussion: 142 patients were enrolled and analysed - 72 ketamine, 70 placebo. POD incidence was 51.4%, with no difference between groups (p=0.867). At d7, there was no significant difference in the incidence of dNCR between groups (ketamine 40.1%, placebo 49.2%, p=0.467).

Postoperative depression was frequent, but there was no significant difference in incidence postoperatively between groups to d7 (VAS ≥ 50/100: ketamine 44.8%, placebo 47.8%; p=0.863).

There was no difference in inflammatory biomarker levels between ketamine treatment groups to d7 (figure). On univariable analysis, IL-6 peak value was associated with POD (IL-6: t=-2.06. p=0.042). Elevated CRP at baseline was associated with dNCR (p=0.001)

We confirmed a rise in inflammatory biomarkers following cardiac surgery and found an association with dNCR and baseline inflammatory state (CRP) and POD with peak inflammatory response

Conclusion(s): A single dose of ketamine at induction for cardiac surgery, consistent with that used in other studies including those related to refractory depression, had no effect on clinical outcomes or inflammatory biomarkers.

32AP06-2

The effect of intraoperative dexmedetomidine on inflammatory markers after coronary artery bypass graft surgery: a randomized controlled trial

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Background and Goal of Study: Systemic inflammation is a common trigger for organ dysfunction in surgical patients. The aim of this study was to investigate whether intraoperative administration of dexmedetomidine can reduce the increase of inflammatory markers after coronary artery bypass graft (CABG) surgery.

Materials and Methods: This prospective experimental study included 70 patients undergoing CABG surgery. Patients in the experimental group (35 patients) received a continuous infusion of dexmedetomidine (0.5µg/kg/h) from anesthesia induction until the end of surgery, while the control group (35 patients) did not. Primary outcomes were the values of inflammatory markers on the first postoperative day (POD1).

Results and Discussion: The groups did not differ in baseline characteristics and comorbidities. In both examined groups, a postoperative increase was found for interleukin-6 (IL-6) (p<0.001), C-reactive protein (CRP) (p<0.001) and white blood cells (WBCs) (p<0.001), as well as neutrophil to lymphocite ratio (NLR) (p<0.001) and platelet to lymphocite ratio (PLR) (p<0.001), but not for fibrinogen. The increase of IL-6 on the POD1 (ΔIL-6) was 72.4 (45.3-94.2) pg/mL in the control group and 79.5 (54.3-107.5) pg/mL in the experimental group (p=0.601) (Figure 1). Δ CRP was 41.0 (20.1-62.1) mg/mL (control group) and 38.6 (24.7-58.9) mg/mL (experimental group) (p=0.979). ΔWBC was 8.2±0.6x10°/L (control group) and 6.7±3.5x10°/L (experimental group) (p=0.078). ΔNLR was 10.1 (6.9-15.0) (control group) and 10.0 (6.0-13.9) (p=0.452). ΔPLR was 95.7 (31.0-144.6) and 93.9 (48.1-162.9) (p=0.561). Δfibrinogen was 0.1 (-0.2-1.0) g/L (control group) and 0.2 (-0.4-0.6) g/L (experimental group) (p=0.472). Consumption of sufentanil and sevoflurane was significantly

lower in the experimental group (p=0.000).

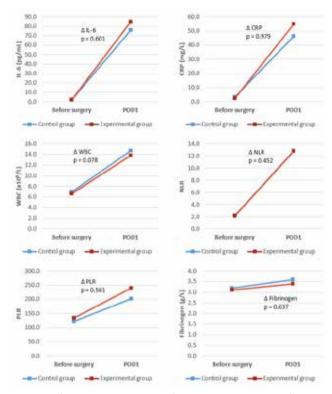


Figure 1. Inflammatory markers before surgery and on the first postoperative day (POD1)

Conclusion(s): Intraoperative administration of dexmedetodine during CABG surgery at a dose of 0.5µg/kg/h without a loading dose does not lead to a decrease in the intensity of the inflammatory response after CABG.

32AP06-3

Dexmedetomidine for reduction of delirium after cardiac surgery – a randomized controlled trial

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Background and Goal of Study: Postoperative delirium is an acute mental disorder that develops after cardiovascular surgery with an incidence of 20-50%. This complication is associated with a longer hospitalization, longer stay in the intensive care unit (ICU), as well as increased morbidity and mortality.

The aim of this study was to determine whether dexmedetomidine versus propofol reduces delirium in patients undergoing cardiac surgery, and analyze their effects on the duration of mechanical ventilation (MV), length of stay in the ICU and total hospital stay.

Materials and Methods: This was a prospective, randomized, single-blinded, controlled clinical trial. All 120 patients included in the study were randomized in a 1:1 ratio into two groups of 60 patients. The first group of patients, upon arrival to the ICU, were

sedated with continuous dexmedetomidine infusion at doses 0.2-0.7 mcg/kg/h. The second group of patients were sedated with continuous propofol infusion in doses 1-2 mg/kg/h. Delirium in the postoperative period was assessed with the CAM-ICU score.

Results and Discussion: There were no significant differences in age and gender distribution and other baseline characteristics between the groups. Both groups had similar preoperative hemoglobin level, heart rate, and left ventricular ejection fraction. The incidence of delirium was 11.7% in the dexmedetomidine group, and 25.0% in the propofol group.

That difference was not significant (p=0.059). Patients who developed delirium had significantly longer duration of MV (12.6 \pm 5.4 vs. 9.3 \pm 2.5 hours, p=0.010). Also, patients who developed delirium had significantly longer total hospital length of stay (7.5 [7.0-9.0] vs. 7.0 [6.0-7.0]; p=0.021). A large controlled trial-DECADE, that included 798 patients, also did not prove that dexmedetomidine infusion decrease delirium in patients after cardiac surgery.

Conclusion(s): Postoperative sedation with dexmedetomidine in comparison to propofol did not decrease postoperative delirium in patients recovering from cardiac surgery.

References:

Turan A, Duncan A, Leung S, Karimi N, Fang J, Mao G, et al. Dexmedetomidine for reduction of atrial fibrillation and delirium after cardiac surgery (DECADE): a randomised placebocontrolled trial. The Lancet. 2020 Jul;396(10245):177–85.

32AP06-4

Dexmedetomidine for reduction of postoperative cognitive dysfunction one year after cardiac surgery – a randomized controlled trial

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Background and Goal of Study: Postoperative cognitive dysfunction (POCD) is a common complication of central nervous system in patients after cardiac surgery. The manifestations of POCD are subtle and may appear up to three months after surgical procedure. Because of that the diagnosis is most often established late, when the patient himself or family members notice difficulties in daily functioning at home or at work.

The aim of this study was to determine whether dexmedetomidine (DEX) versus propofol reduces POCD in patients one year after cardiac surgery.

Materials and Methods: This was a prospective, randomized, single-blinded, controlled clinical trial. All 60 patients included in the study were randomized in a 1:1 ratio into two groups of 30 patients. The first group of patients, upon arrival to the ICU, were sedated with continuous DEX infusion at doses 0.2-0.7 mcg/kg/h. The second group of patients were sedated with continuous propofol infusion in doses 1-2 mg/kg/h. A telephone survey was conducted with all subjects one year after surgery to compare differences in the patients' functional and cognitive status.

Results and Discussion: There were no significant differences in age and gender distribution and other baseline characteristics between the groups. By comparing the two examined groups, we found that memory problems were more common in the propofol group versus DEX group (39.3% vs. 15.4%, p=0.05). A statistically significant difference between the groups of patients sedated with propofol and DEX was also observed in concentration (25.0% vs. 3.8%, p=0.03) and sleep problems (35.7% vs. 7.7%, p=0.01). Other symptoms of POCD, the ability of patients to take care of themselves and move about independently, and mortality did not differ significantly between the two groups. In a meta-analysis that included 2183 patients DEX has been associated with a decrease in postoperative cognitive and behavioral dysfunction which is similar to our results.

Conclusion(s): Dexmedetomidine reduced the symptoms of POCD and has a beneficial effect on memory, concentration and sleep in the first year after cardiac surgery.

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32AP06-5

Does the use of loop diuretics before cardiopulmonary bypass improve kidney function during cardiac surgery?

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Background and Goal of Study: The use of loop diuretics (LDs) during cardiac surgery with cardiopulmonary bypass (CPB) is debated, with some studies suggesting negative effects on nephron function, while others advocate for their renal protective role through forced diuresis [1.2].

The aim of this study was to evaluate renal function linked to the use of LDs before CPB by measuring partial urinary oxygen tension (PuO₂).

Materials and Methods: This prospective pilot study included 30 patients undergoing on pump coronary artery bypass grafting. The median age was 61 years (52-64 y.). Exclusion criteria: age <25 years or >65 years, glomerular filtration rate (eGFR) <90 mL/ min/1.73 m², and diabetes mellitus.

Patients were divided into two groups based on receiving 20 mg of furosemide before CPB: Group A (no furosemide) and Group B (with furosemide). Urine for PuO₂ were collected via a urethral catheter at three time points: T₁ - 10 minutes before CPB, T₂ - 20 minute of CPB, and T₃ – prior to ICU transfer.

Acute kidney injury (AKI) was diagnosed using the Kidney Disease Improving Global Outcomes criteria. Data were collected intra- and for 48 hours postoperatively.

Results and Discussion: There were no significant differences between the groups in terms of demographic characteristics, protocols of anesthesia or CPB. CPB duration (p=0.302), nadir hemoglobin level (p=0.381) and nadir DO₂ (p=0.391) did not differ between groups. ANOVA revealed no significant differences in PuO₂ across all time points for Group A (p=0.204).

Group B showed a decrease in PuO₂ during surgery (p=0.038). PuO₂ levels between the groups were similar at T₁ (p=0.830) and T_a (p=0.230) but differed at T_a (61.4±13.9 mmHg vs. 50.4±14.8 mmHg, p=0.044). No AKI was observed in both group during the first two p/o days.

However, Group A exhibited significantly lower creatinine levels on the 2-nd p/o day compared to Group B (87.4±13.5 µmol/L vs. 108.5±22.6 μmol/L, p=0.031).

Conclusions: Our findings suggest that the prophylactic use of LDs may impair renal oxygenation and function during CPB. PuO₂ is an informative criterion for assessing renal functional status during cardiac surgery.

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32AP06-6

Carbon dioxide insufflation-induced burst suppression during endoscopic cardiac surgery: a case report

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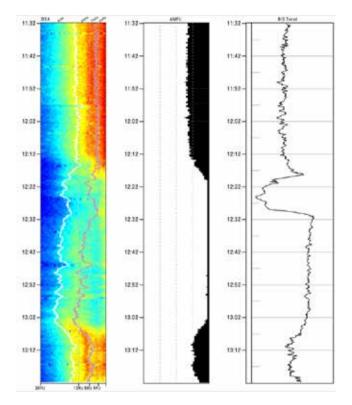
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Background: The increasing use of endoscopy in cardiac surgeries is driven by their advantages of smaller incisions and faster recovery. In this case, BIS monitor revealed burst surpression caused by CO2 insufflation entering systemic circulation after an incision in the right atrium.

Case report: A 64-year-old male was diagnosed with severe mitral regurgitation and was scheduled for MICS (Minimal Incision Cardiac Surgery) mitral valve surgery. Preoperative examinations revealed no abnormalities. Intraoperative readings were stable until the surgeon open the right atrium for tricuspid valve repair. At this point, DSA monitoring detected significant burst suppression (shown in the attached figure, from approximately 12:20 to 13:07). The surgery was successfully completed at 14:30, and the patient was extubated at 17:00, with hemodynamic stability and normal oxygenation.

However, severe postoperative delirium, scoring 7 on the CAM-ICU-7 assessment and GCS: E4V5M6 was noted. After ICU observation, the delirium resolved by the following morning, and the patient was transferred to the general ward and discharged four

Discussion: In this case, despite no significant changes in inhalational anesthetic concentration or hemodynamic stability, the BIS monitor displayed burst suppression, a phenomenon linked strongly to postoperative delirium. Based on prior DSA pattern observations, this presentation closely resembles CO2 toxicity. We determined that CO₂ toxicity was caused by insufflated CO₂ entering the systemic circulation directly after the right atrium was incised during the endoscopic procedure.



References:

Carbon dioxide insufflation and neurocognitive outcome of open heart surgery. Asian Cardiovasc Thorac Ann. 2015.

Learning points: As endoscopic cardiac surgeries become more common and efforts to enhance postoperative recovery continue, this case highlights the importance of monitoring DSA patterns during right atrial incision. Prolonged CO2 toxicity should prompt discussions with the surgical team about adjusting CO2 port pressures to mitigate extended burst suppression, ultimately aiming for better postoperative recovery outcomes.

32AP06-7

Preoperative value of serum creatinine and intraoperative diuresis as indicators of acute renal insufficiency in cardiovascular surgery patients

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Background and Goal of Study: Acute renal insufficiency (ARI) is a common complication following cardiovascular surgeries, and early recognition can be vital. Despite renal function impairment, serum creatinine (sCr) levels may fall within reference values; hence, an exact sCr level as a threshold for ARI onset is not defined.

Objective: To determine whether preoperative sCr level in nondialyzed patients serves as a reliable indicator for ARI occurrence post-cardiovascular surgery with cardiopulmonary bypass. and whether intraoperative diuresis observed across operation phases (pre-extracorporeal circulation (ECC), during, and post), as well as total intraoperative diuresis, could be considered reliable markers for ARI onset.

Materials and Methods: A prospective observational study included 83 previously non-hemodialyzed patients undergoing elective cardiovascular surgery with cardiopulmonary bypass. Preoperative sCr levels were determined for participants, categorizing them into three groups:

Group 1, sCr <115 µmol/l;

Group 2, sCr 115-140 µmol/l; and,

Group 3, sCr >140 µmol/l.

Intraoperative diuresis was recorded across operation phases (pre-, during, and post-ECC), along with total intraoperative diuresis. Postoperatively, ARI development and need for hemodialysis were noted. Data analysis was performed using SPSS 17, with p < 0.05 considered statistically significant.

Results and Discussion: Significant differences were observed among the three patient groups regarding ARI development. Patients with preoperative sCr above 140 µmol/l notably experienced postoperative ARI (53.8%). ROC analysis indicated preoperative sCr in Group 3 patients (sCr >140 µmol/l) as a predictor for ARI (Area = 0.780; p = 0.016), with a cut-off of 191.5. Sensitivity was 71.4%, and specificity was 91.7%.

Both total intraoperative diuresis and diuresis pre-, during, and post-ECC showed statistical significance between patients developing ARI and those who did not. ROC curves suggested post-ECC diuresis (p < 0.0005; Area = 0.897; cut-off 55; sensitivity 82.6%; specificity 80%) and total intraoperative diuresis (p < 0.0005; Area = 0.839; cut-off 265; sensitivity 78.3%; specificity 76.7%) as predictors for ARI.

Conclusion(s): A preoperative sCr level above 140 µmol/l can serve as a marker for predicting ARI (Cut-off value 191.5 µmol/I), with a sensitivity of 71.4% and a specificity of 91.7%. Post-extracorporeal circulation diuresis as well as total intraoperative diuresis also represent reliable markers for the onset of ARI after cardiovascular surgery.

32AP06-8

The effect of red blood cell transfusion on oxygen delivery and oxygen consumption after cardiac surgery

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Background and Goal of Study: Red blood cell (RBC) transfusions are commonly used during cardiac surgery. Clinical guidelines suggest that RBC transfusions should be based on the patient's hemoglobin (Hb) levels and clinical condition(1). However, it is unclear which aspects of the clinical condition are most relevant.

The aim of our study was to investigate how hemodynamic measurements (heart rate, blood pressure, cardiac output) and oxygenation parameters (Hb. mixed venous oxygen saturation [SvO2], and lactate) predict improvements in oxygen extraction ratio (O2ER) - the ratio of oxygen consumption to oxygen delivery - following an RBC transfusion. Our hypothesis was that SvO2 would predict improvement in O2ER.

Materials and Methods: We recruited patients scheduled for elective or urgent cardiac surgery. If RBC were transfused (transfusion threshold Hb < 80 g/L) in the intensive care unit after surgery, the following measurements were made 10 minutes before and 10 minutes after the transfusion: arterial - and mixed venous blood gas analysis, hemoglobin, cardiac output, blood pressure, heart rate.

The patient was considered to have benefited from the transfusion if O2ER decreased by at least 5%. AUROC values were used to evaluate the discrimination capacity of hemodynamic - and oxygenation variables.

Results and Discussion: A total of 156 patients were recruited for the study. Of these, 31 received RBC transfusions, and measurements were performed on 26 patients during 44 transfusions. None of the studied variables had reliable discrimination. The AU-ROC value for SvO₂ was the highest at 0.666 [95% confidence interval: 0.486-0.845], but this finding was not statistically significant. Using a threshold value of SvO₂ > 65%, the negative predictive value of the test was 81%.

Conclusion(s): Based on this study, no single hemodynamic - or oxygenation variable reliably discriminates between patients who benefit from RBC transfusions and those who do not. If SvO₂ is >65%, it is unlikely that a cardiac surgical patient will benefit from an RBC transfusion during intensive care.

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32AP06-9

The impact of advanced therapy in acute kidney injury following complex cardiac surgery: a case report

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Background: Acute kidney injury (AKI) is a common and severe complication following cardiac surgery, particularly when associated with multiple organ dysfunction syndrome (MODS). This case report highlights the successful use of continuous renal replacement therapy (CRRT) and CytoSorb in recovering a patient with severe AKI and MODS. The novelty lies in the integrated approach combining hemodynamic stabilization and innovative renal support.

Case Report: A 50-year-old male with severe heart failure (EF 22%), left ventricular aneurysm, and complex valvular insufficiencies underwent coronary artery bypass grafting, left ventricular aneurysmoplasty, tricuspid valve repair, and mitral valve replacement. Postoperatively, the patient developed cardiogenic shock, requiring intra-aortic balloon pump (IABP) support, Levosimendan, norepinephrine, and dobutamine.

AKI was diagnosed on postoperative day two and managed with CRRT and CytoSorb, restoring renal function within 96 hours. Hepatic dysfunction also resolved, and the patient was discharged from intensive care after 14 days without inotropic support, with EF improved to 30%.

Discussion: This case emphasizes the importance of advanced, multidisciplinary management in cardiac surgery patients with severe postoperative complications. The integration of CytoSorb in MODS treatment offers a promising adjunct for managing AKI and modulating systemic inflammation, addressing a gap in outcomes for such cases.

References:

- 1. Karkouti K, et al. 'Acute kidney injury after cardiac surgery: risk factors, pathophysiology, and management.' Can J Anaesth.
- 2. Ronco C, et al. 'Continuous renal replacement therapy in critical illness.' Nat Rev Nephrol. 2017.
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Learning points:

- Advanced therapies like CRRT and CytoSorb can be pivotal in managing AKI and MODS following cardiac surgery.
- Multidisciplinary approaches and technological innovation improve outcomes in complex cases.
- Early diagnosis and tailored intervention are critical for recovery and prognosis.

32AP06-10

Assessment of the effectiveness of intravenous lidocaine infusion on early rehabilitation of patients after heart valve surgery

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Background and Goal of Study: Postoperative rehabilitation of patients undergoing heart valve surgery (HVS) remains an unresolved issue. Physical inactivity remains at high levels after cardiac surgery, reaching up to 50% [1], which may be associated with the surgical procedure, duration of cardiopulmonary bypass (CPB), mechanical ventilation (MV), and the protocols of anesthesia.

The aim of the study was to evaluate the effectiveness of intravenous lidocaine infusion as a component of multimodal anesthesia on early rehabilitation of patients after heart valve surgery.

Materials and Methods: The study included 90 patients (mean age 59±7.3) who underwent heart valve surgery. Patients were divided into two groups based on anesthesia management. Induction in both groups: propofol (1.5 mg/kg, 40 mg increments every 15-20 seconds), fentanyl (1-1.5 µg/kg), rocuronium bromide (0.1 mg/kg). In Group A (n = 45), anesthesia maintenance: sevoflurane (1-1.5 MAC), lidocaine (1 mg/kg bolus followed by infusion 1.5-2 mg/kg/h). In Group B (n=45), anesthesia maintenance: sevoflurane (1.5-2 MAC). Analgesia in both groups – fentanyl (15-20 µg/ kg for the entire surgery).

Results and Discussion: The need for postoperative analgesia was significantly lower in Group A compared to Group B (mean morphine dose: 8.2±1.8 mg vs. 12.4±2.5 mg, p=0.015). The duration of MV in Group A was 2.3±0.8 hours, which was shorter than in Group B (3.6±1.4 hours), (p=0.033). ICU stay was shorter in Group A (42.8±5.3 hours vs. 54.4±6.8 hours, p=0.017). The overallhospital stay didn't differ between groups (11.2±2.1 days vs. 12.4±3.7 days, p=0.105). CRP and IL-6 levels in Group A were significantly lower in the first 24 hours postoperatively, indicating a reduced systemic inflammatory response (CRP: 34.8±8.5 mg/L vs. 58.7±11.3 mg/L, p=0,038; IL-6: 66.3±12.1 pg/mL vs. 82.4±15.6 pg/mL, p=0.0011).

Conclusion(s):

- 1. Lidocaine infusion during heart valve surgery reduces postoperative pain, the duration of MV, ICU stay.
- 2. The reduction in CRP and IL-6 levels indicates an anti-inflammatory effect of lidocaine and may be a promising strategy to improve early rehabilitation after heart valve surgery.

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32AP06-11

Changes in systemic hemodynamics, cardiac energetics and cell signaling pathways induced by VA-ECMO alone or with left ventricular unloading devices

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Background: Severe cardiogenic shock (CS) remains a significant clinical challenge. Veno-arterial extracorporeal membrane oxygenation (VA-ECMO) is the most widely used temporary mechanical circulatory support (tMCS) for patients with refractory CS. While VA-ECMO rapidly restores end-organ perfusion, it also increases left ventricular (LV) loading, myocardial wall stress, pressure-volume area (PVA), and myocardial oxygen consumption.

To mitigate VA-ECMO-induced LV overload, mechanical unloading strategies, such as intra-aortic balloon pump (IABP) or Impella, may be added. Beyond reducing LV load, these benefits may involve modulation of RISK and SAFE signaling pathways.

We hypothesized that adding IABP or Impella to VA-ECMO would alleviate LV overload, improve cardiac energetics, and beneficially modulate RISK and SAFE pathways in the myocardium.

Methods: Severe CS was induced in female Dorset sheep using coronary artery alcoholization. Animals were randomized into three groups: ECMO alone, ECMO+IABP, or ECMO+Impella. Hemodynamic parameters, myocardial injury markers, and phosphorylation of SAFE and RISK signaling proteins were assessed.

Results and Discussion: A total of 25 sheep were included: 9 in the ECMO group, 8 in the ECMO+Impella group, and 7 in the ECMO+IABP group, Ischemia lasted 349 ± 13 minutes, ECMO support 197±9 minutes, and anesthesia 526±12 minutes. CS was characterized by a 30± 3% decrease in mean arterial pressure (MAP), a 37± 2% decrease in cardiac output (CO), and a 52±10% increase in LV end-diastolic pressure (LVEDP).

In the VA-ECMO-only group, right atrial pressure (RAP) decreased dose-dependently with ECMO flow, while LV systolic pressure and end-systolic volume increased, and LV end diastolic pressure remained stable. PVA and potential energy increased with ECMO flow, reflecting heightened myocardial stress. Adding IABP or Impella to VA-ECMO reduced RAP, LVEDP, and PVA, indicating improved ventricular filling and reduced myocardial wall stress.Infarct size did not differ significantly between groups.

Apoptotic cell counts were unchanged across groups. Myocardial signaling analysis showed increased phosphorylation of Akt and ERK1/2 in specific groups and zones, indicating activation of survival pathways.

Conclusion: Combining VA-ECMO with IABP or Impella effectively mitigates ventricular overload, modulates cardioprotective signaling pathways, and improves cardiac function in severe CS.

32AP06-12

From preoperatively diagnosed right atrial myxoma to intraoperatively diagnosed extremely rare pericardial tumor: the trick of transesophageal echocardiography

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Background: Primary cardiac tumors are rare, with an incidence rate of 0.0017%-0.019% in the autopsy series. The most common are myxomas, usually in the left or right atrium.

Case Report: We present a case of a 52-year-old male patient, for whom was consulted a cardiologist due to increased fatigue over the past few months. A tumoral change in the right atrium was seen on transthoracic echocardiography. Transesophageal echocardiography (TEE) confirmed a tumoral change, characteristic of myxoma, in the projection of the right atrium, size 35x31 mm, attached to the free wall of the right atrium above the mouth of the inferior vena cava (Figure 1).



Figure 1.

The heart team indicated surgical intervention. After pericardiotomy, a pericardial tumor was seen on the lateral wall of the right atrium and ventricle (Figure 2).

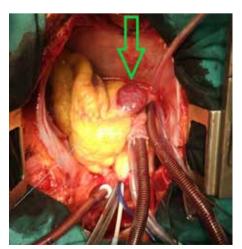


Figure 2.

A complete excision of the tumor was performed. Pathohistological analysis showed that it was an extremely rare tumor - pericardial hemandioma.

Discussion: Pericardial hemangioma is an extremely rare tumor. with just over 10 cases described in the literature. Knowing the exact location of a cardiac tumor is essential for the cardiac anesthesiologist in cases such as the placement of a pulmonary artery catheter or temporary pacemaker.

Very often, the choice of anesthetic drugs, or the adjustment of drug doses to avoid hemodynamic instability, also depends on the localization of the tumor.

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Rajic J, Zdravkovic R, Redzek A, et al. Genuine biatrial myxoma: The rarest form of myxoma. Polish Heart Journal. 2023;81:184-5. Rosic M, Zdravkovic R, Komazec N, Rosic V. An unusual case of localization of papillary fibroelastoma on the upstream side of the tricuspid valve. Polish Heart Journal. 2023:81:405-7.

Learning Points: Transesophageal echocardiography alone is not sufficient for the accurate localization of cardiac tumors.

32AP07-1

Monitored anesthesia care and conscious sedation for trans-femoral Impella CP placement: An alternative to general anesthesia in patients with severe left ventricular impairment undergoing percutaneous coronary intervention with expected hemodynamic instability

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The Impella CP is a left ventricular assist device typically placed through trans axillary or trans femoral approach with fluoroscopic and echocardiographic guidance under general anesthesia to unload the left ventricle and to support the hemodynamics.

In this case report, we describe a patient who is diagnosed to have a multivessel coronary artery disease with severe cardiac failure (Left Ventricular Ejection Fraction is 15 %) with chronic obstructive pulmonary disease (COPD) undergoing a high risk percutaneous coronary intervention with expected hemodynamic instability as he was not fit to go for coronary artery bypass grafting surgery due to high risk of perioperative mortality and morbidity.

Here, we describe the successful placement of the Impella CP with sedation and regional anesthesia during the procedure in order to avoid general anesthesia and the possible sequelae of prolonged post procedure ventilation in such a frail patient. Impella placement was confirmed with point-of-care transthoracic echocardiography.

Monitored Anesthesia Care with conscious sedation and close hemodynamic monitoring with invasive blood pressure throughout the procedure until successful three coronary arteries intervention achieved using drug eluting stents followed by successful weaning and removal of Impella directly after the procedure.

The patient was discharged to Cardiac Care Unit (CCU) for one day and then discharged to Cardiac Ward (CW) for another one day then discharged home.

This case report demonstrates a novel anesthesia management for placing the Impella CP during coronary artery intervention procedure which can shorten patient's hospital stay, decrease the risk of morbidity and, more importantly, open the possibility to further prospective studies of this technique.

32AP07-2

Early prosthetic valve endocarditis; how complicated can it be? A young man journey with severe infection; from pseudoaneurysm surgical repair to TEVAR

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Background: Infective endocarditis (IE) is a rare but severe condition with increasing prevalence due to aging populations and frequent use of cardiac implants. Prompt diagnosis and multidisciplinary management are essential to reduce its high morbidity and mortality.

Case Report: A 37-year-old male presented with sternal wound dehiscence, mediastinitis, septicemia, and CKD two months after mitral valve repair. He reported wound discharge and fever but was hemodynamically stable. CT imaging revealed a substernal collection and pseudoaneurysm. Cultures identified Klebsiella pneumoniae and Enterobacter as pathogens.

The patient underwent emergency repair of an ascending aortic pseudoaneurysm under femoro-femoral bypass, coupled with sternal wound debridement. Postoperatively, he required broadspectrum antibiotics, mild inotropic support, and dialysis. On day four, a recurrent aortic leak caused by septicemia-induced tissue friability necessitated re-exploration and repair. After prolonged hospitalization under a multidisciplinary team (MDT), he was discharged stable.

Four weeks later, he was readmitted for a persistent pseudoaneurysm leak. Due to the high risk of a third open surgery, TEVAR (thoracic endovascular aortic repair) was performed successfully. Following two months of antibiotic therapy and hemodialysis, infections resolved, renal function normalized, and follow-up imaging showed no residual leak. The patient reported no complaints at subsequent follow-ups.

Discussion: This case underscores the complexity of IE, highlighting the importance of multimodal imaging (e.g., echocardiography and CT) for diagnosis, culture-sensitive antibiotics for infection control, and hybrid procedures like TEVAR for highrisk complications. A collaborative MDT approach was pivotal in achieving a positive outcome for this patient.

References:

1. Delgado V, Ajmone N et al. 2023 ESC Guidelines for the management of endocarditis. European Heart Journal, Volume

44, Issue 39, 14 October 2023, Pages 3948-4042 2. Manetta, F., Newman, J., & Mattia, A. (2018). Indications for Thoracic EndoVascular Aortic Repair (TEVAR): A Brief Review. The International Journal of Angiology, 27(4), 177-184 Learning points:

- · Infective endocarditis (IE) can cause severe complications, even in young, healthy patients.
- Management often requires prolonged care, surgery, or endovascular interventions.
- Hybrid procedures like TEVAR are valuable for high-risk cases.
- Multidisciplinary teamwork is essential.

32AP07-4

Cellular localization of myocardial fibrosis and inflammation components in congestive heart failure following an aortocaval shunt in rats

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Background and Goal of Study: In previous works, it was shown that the modified model of infrarenal aortocaval fistula (ACF) causes a chronic ventricular volume overload, which results in congestive heart failure. The goal of this study was to investigate morphological changes of components in myocardial inflammation and fibrosis processes based on a chronic volume overload

Materials and Methods: After approval by the animal protection committee, an infernal aortocaval fistula was placed in male Wistar-rats with a 16G needle. After 28 days, the myocardial mophology and tissue fibrosis, as well as the localization and involvement of signaling pathways was checked with confocal microscopy, RT-PCR and Western Blot analysis.

Results and Discussion: Besides a ventricular hypertrophy and a pronounced myocardial fibrosis, the ACF-rats showed an increase in expression of inflammation and fibrosis markers such as e.g. Interleukin 1 beta (IL-1

), Tissue inhibitor of metalloproteinase 4 (TIMP4), macrophages, Transforming growth factor beta (TGF-□), Vimentin, Phospho-SMAD, Tenascin-C (TNC), Alpha-smooth muscle Actin (alpha-SMA), Collagen triple helix repeat containing 1 (CTHRC1), Cardiotrophin, Cartilage secreted frizzled-related protein 2 (sFRP2), oligomeric Matrix Protein (COMP), Collagen 1, Galectin, and Osteopontin. The ACF-rats also exhibited a doubling in heart- and lung-to-body weight indices while displaying a significantly reduced ejection fraction.

Conclusion(s): These findings suggest pronounced remodeling processes as a result of chronic volume overload with consecutive heart failure. The in this model for the first time proven myocardial inflammation and fibrosis processes allow a precise pathophysiological study of the underlying mechanisms and give hints for possible treatment starting points in the near future.

References:

1. Dehe L, Mousa SA, Shaqura M, et al. Naltrexone-Induced Cardiac Function Improvement is Associated With an Attenuated Inflammatory Response and Lipid Perioxidation in Volume Overloaded Rats. Front Pharmacol; 2022 Jun 30;13:873169. doi: 10.3389/fphar.2022.873169

32AP07-5

Changes in cardiac glucocorticoid receptor expression following volume overload-induced heart failure in rat

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Background and Goal of Study: Cardiac glucocorticoids have been reported to play a regulatory role in both normal and pathological states, such as heart failure. However, the expression and localization of the corresponding glucocorticoid receptor (GR) in the context of chronic heart failure is still unclear (1).

Materials and Methods: By creating an infrarenal aortocaval fistula (ACF), an experimental heart failure model was established in rats through chronic volume overload. Twenty-eight days after ACF induction, adaptive GR expression in the left ventricle was assessed using reverse real-time PCR and Western blot analysis. Furthermore, the colocalization of GR with the mineralocorticoid receptor (MR), as well as with the membrane-bound Na/K-AT-Pase and the L-type calcium channel, was examined using dual immunofluorescence confocal microscopy.

Results and Discussion: Our Western blot and PCR analyses reveal a significant increase in GR mRNA and GR protein levels. respectively, in the left ventricle of ACF rats. Immunofluorescence microscopy demonstrated that GR is in close association with the membrane-bound Na/K-ATPase and the L-type calcium channel on the plasma membrane as well as the invaginated T-tubules of cardiomyocytes in the left ventricle.

Additionally, GR colocalized with MR in the sarcoplasmic reticulum of left ventricular cardiomyocytes. Furthermore, there was an upregulation of GR immunoreactivity within the cardiomyocytes of ACF rats.

Conclusion(s): This study provides initial evidence for an upregulation of GR expression and its central role in the functional adaptation of cardiomyocytes under conditions of cardiac stress due to volume overload-induced heart failure.

The colocalization with components of intracellular myocardial calcium homeostasis suggests a potential influence of glucocorticoids on these mechanisms.

Reference:

1. Dehe L, Mousa SA, Aboryag N, et al. Identification of Mineralocorticoid Receptors, Aldosterone, and Its Processing Enzyme CYP11B2 on Parasympathetic and Sympathetic Neurons in Rat Intracardiac Ganglia. Front Neuroanat; 2022 Jan 11;15:802359. doi: 10.3389/fnana.2021.802359

32AP07-6 Isolated pulmonary stenosis: an anesthetic quandary

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Background: Pulmonary stenosis refers to a dynamic or fixed anatomic obstruction to flow from the right ventricle to the pulmonary arterial vasculature. Isolated pulmonary stenosis forms about 10% of all congenital heart diseases. It can present directly in adulthood with more severe forms.

Case Report: We are reporting a case of a 45yr old female incidentally diagnosed with severe pulmonary stenosis posted for total abdominal hysterectomy with bilateral salpingo-oopherectomy post pulmonary valve balloon dilatation. To achieve the perioperative goals, invasive lines were secured to guide the anaesthesia management intraoperatively.

Our patient had an episode of bradycardia which was managed effectively in accordance with the ACLS bradycardia algorithm. Adequate analgesia was ensured to prevent the development of any post-operative complications.

Discussion: Pulmonary stenosis maybe valvular, subvalvular or supravalvular. The goals of hemodynamic management in the perioperative period are maintenance of right ventricular preload, left ventricular afterload and right ventricular contractility.

Sudden reduction in systemic vascular resistance reduces the cardiac output which in turn increases RV work and can precipitate heart failure.

References:

- 1. Sanikop CS, Umarani VS, Ashwini GS. Anaesthetic management of a patient with isolated pulmonary stenosis posted for caesarean section. Indian Journal of Anaesthesia. 2012 Jan 1;56(1):66-8.
- 2. Sushma KS, ShAiKh S, Anaesthetic management of pulmonary stenosis already treated with pulmonary balloon valvuloplasty. Journal of Clinical and Diagnostic Research: JCDR. 2014 Jan:8(1):193.

Learning points: Pulmonary stenosis is a progressive condition and can manifest well into adulthood with severe features and hence, requires multidisciplinary approach, careful and meticulous planning in its management.

32AP07-8

Anesthetic management for heart transplantation in a patient with a ventricular assist device

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Background: Heart transplantation is often the last line of treatment for patients with advanced heart failure. The introduction of ventricular assist devices (LVADs) has enabled prolonged survival by offering an alternative to transplantation.[1]

Case Report: A 68-year-old patient proposed for heart transplantation due to advanced heart failure caused by dilated cardiomyopathy of ischemic etiology.

Previously, due to advanced heart failure, a left ventricular assist device - HeartMate®3 - had been implanted as a bridge therapy to heart transplantation.

During the preoperative assessment, several particularities were identified that required special attention. It is a continuous flow device that does not generate a pulse, which significantly alters the patient's hemodynamics, making conventional clinical assessment of blood pressure and heart rate difficult.

Due to the low pulsatility caused by the device, invasive monitoring of mean arterial pressure through catheterization of the radial artery was carried out echographically using its location, wall characteristics and absence of collapsibility to identify it. A central venous catheter was also echographically placed in the internal jugular vein and central venous pressure was monitored. Anesthesia was induced with fentanyl, etomidate and rocuronium due to the risk of hemodynamic depression. During surgery, strict control of blood volume was necessary as adequate preload is essential for the LVAD to function correctly and increased afterload can decrease pump flow.

LVAD flow maintenance was monitored continuously to avoid alterations that could compromise coronary or cerebral perfusion. The heart transplant was successful and the patient was discharged from hospital on the 13th postoperative day.

Discussion: This case illustrates the complexity of anesthetic management in patients with LVADs and the importance of an interdisciplinary approach to ensure the success of heart transplantation. The integration of anesthetic strategies with the specific physiological characteristics of ventricular assist devices is fundamental to optimizing the clinical outcomes.

References:

1. Card Fail Rev. 2015 Apr;1(1):25-30.

Learning points: The anesthetic management of a patient with LVAD for heart transplantation is challenging for the anesthesiologist and requires a different and specific approach.

32AP07-9

From monitored anaesthesia care to potential major intervention: Managing cardiac tamponade in a pregnant patient with cardiac angiosarcoma

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Background: Managing anaesthesia in pregnant women undergoing urgent non-obstetric surgery is complex, especially with a viable but premature foetus. Cardiac tamponade, though rare, is life-threatening and carries a high risk of hemodynamic collapse. Cases involving third-trimester pregnancy and cardiac tamponade are particularly rare and educationally significant.

Case Report: A 39-year-old pregnant woman (32 weeks gestation) presented to the ER with dyspnoea and dizziness, later diagnosed with massive cardiac tamponade. The medical team opted for percutaneous drainage in the Operating Room.

All precautions were taken, including readiness for sternotomy, emergency C-section, and neonatal intensive care. The patient, tachycardic, tachypnoeic, and hypertensive, underwent the procedure under monitored anaesthesia care, including invasive blood pressure monitoring and IV analgesia for discomfort.

Over 1000 mL of hematic fluid was drained, and a pericardial drain was placed. She remained hemodynamically stable without vasopressors and was admitted to the ICU where she was diagnosed with an intracardiac mass (right atrium).

To enable further investigation and avoid foetal harm, a C-section was performed after lung maturation, under combined spinalepidural anaesthesia. The mass was later confirmed as cardiac angiosarcoma following biopsy.

Discussion: This rare case of cardiac tamponade in pregnancy caused by cardiac angiosarcoma emphasizes the importance of a multidisciplinary approach. Anaesthetic management was successful, guided by thorough preparation for worst-case scenarios. Coordinated efforts ensured favourable outcomes for both mother and newborn.

References:

- 1. Masten M. et al, A Rare Case of Obstructive Shock due to Cardiac Tamponade in a Term Pregnancy. AJP Rep 2023;13:e94-e97. DOI https://doi.org/ 10.1055/a-2200-3497.
- 2. Waness A. Elusive Cardiac Angiosarcoma in a Young Pregnant Female: Rare Presentation With Fatal Outcome. Cardiol Res. 2015 Jun 11;6(3):292-296. doi: 10.14740/cr402w

Learning points: Intracardiac malignant masses are rare and carry a poor prognosis. When combined with pregnancy, they present unique challenges requiring meticulous multidisciplinary planning and management to optimize maternal and foetal outcomes.

32AP07-11

Preoperative assessment of inferior vena cava collapsibility as a predictor of postoperative complications after left ventricular device implantation

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Background and Goal of Study: Left ventricular assist device (LVAD) is used in end-stage heart insufficiency either as a bridge to heart transplantation, recovery, or destination therapy. With the development of new-generation devices, the one-year survival rate after surgery has increased. However, the risk for postoperative complications remains high. One of the risk factors for an unfavourable outcome is right ventricular insufficiency.

As stiffness of the vena cava inferior (VCI) may be the hallmark of right ventricular failure, we conducted a study to assess the influence of preoperative VCI measurement on postoperative complications.

Materials and Methods: Forty patients who were hospitalized at the University Hospital between 11.2021 and 12.2023 after LVAD implantation were enrolled in the study. Prior to the surgery, comprehensive echocardiography was performed by a cardiologist. VCI diameter was measured during expiration and inspiration. VCI stiffness was diagnosed if the decrease in VCI diameter during inspiration was less than 50%. Postoperatively, patients were assessed for complications, such as acute kidney injury (AKI), respiratory complications, and delirium.

Results and Discussion: VCI stiffness was found in 80% of patients (n = 32/40), and normal VCI collapsibility was found in 20% of patients (8/40). Respiratory complications occurred in 43% (n = 14/32) of the patients with VCI stiffness and in none of the patients with normal VCI collapsibility (p = 0,017). AKI was diagnosed in 37% of patients with VCI stiffness (n = 12/32) and in 25% (n = 2/8) of patients without VCI stiffness (p = 0,128). Delirium was found in 25% of patients with VCI stiffness (n= 8/32) and in one patient without VCI stiffness (p = 0,192).

There was a significant difference in the postoperative length of stay in the intensive care unit between patients with and without VCI stiffness (median, 5 vs. 2 days; p = 0,0002). However, a statistically significant correlation was found between increased inspiratory VCI diameter and the occurrence of postoperative complications. In the ROC analysis, the cut-off value for inspiratory VCI diameter was determined for AKI - 17 mm (AUC 0,77; p = 0,004), respiratory complications – 21 mm (AUC 0,83; p = 0,0001) and delirium - 20 mm (AUC 0,73; p = 0,023).

Conclusion: Echocardiographic assessment of VCI may help identify patients at risk for postoperative complications. Further studies with a larger group of patients are needed.

32AP07-12

Hypotension Prediction Index as a parameter for goal-directed hemodynamic management during kidney transplantation: a single center experience

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Background: Kidney transplantation represents the treatment of choice in end-stage kidney disease, with superior survival and improved quality of life over dialysis. Delayed graft function (DGF), defined as the need for dialysis within the first post-transplant week, is a common early complication and it is associated with about 40% higher risk of graft loss. The aetiology of DGF is multifactorial, but maintaining an adequate perfusion pressure to the transplanted kidney is crucial.

Our aim was to evaluate whether the use of blood pressure monitoring based on Acumen Hypotension Prediction Index (HPI) of Edwards Lifesciences can support intraoperative decision making by protecting against DGF.

Materials and Methods: Fifty orthotopic kidney transplant recipients who underwent surgery between January 2024 and October 2024 were analyzed after approval by the Internal Board of the Regional Authority of Transplantation. Three cases were excluded due to intraoperative severe complications; the study therefore included a population of 47 patients, who received kidneys from donors either brain dead (86%) or cardiac dead (12%). Patients were randomly assigned to receive HPI monitoring or standard care and divided into two groups. Incidence of DGF in the two groups were then compared.

Results: Twenty-seven patients (57.45%) received intraoperative monitoring with HPI device, while twenty (42.55%) received standard monitoring provided by the approved internal anesthesiology protocol. Six patients in the HPI group (22.2%) experienced DGF versus six patients (30%) in the standard monitoring group (p=0.7365). In the HPI group, we found a non-statistical difference in mean intraoperative HPI between the DGF and regular function groups (32.16 versus 23, p=0.67982). The ROC curve of HPI values for DGF obtained an area under the curve of 0.611 (95% CI 0.391-0.83).

Conclusion: In our analysis, HPI monitoring does not reduce the risk of DGF compared to conventional monitoring. However, our results may be underestimated due to the small sample studied, the difficulty in assessing the characteristics and heterogeneity of cold ischemia during the organ allocation period and the consolidation of operators' confidence in the hemodynamic assessment method.

The strong reference of the hemodynamic assessment method to the principles of prevention of hypotensive events certainly deserves further investigation in the field of ex-vivo perfusion and in the management of marginal organs.

Anaesthetic challenges in a complex patient with Emery-Dreifuss muscular dystrophy and systemic sclerosis undergoing open tricuspid valve replacement surgery

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Background: Emery-Dreifuss Muscular Dystrophy(EDMD) is a rare genetic disease characterised by progressive muscle weakness, contractures and cardiac conduction defects. Its prevalence is estimated 0.39 per 100 0001. Systemic sclerosis(SSc), a chronic autoimmune connective tissue disorder, leads to multiorgan fibrosis. Co-existence of EDMD and SSc in a single patient presents unique challenges to the anesthetist.

Case Report: 57 year old male with EDMD and SSc presented with worsening dyspnoea and effort tolerance. Transesophageal echocardiography (TEE) showed left ventricular ejection fraction 40%, severe tricuspid regurgitation with flail posterior leaflet. Besides mild proximal weakness, he was pacing-dependent with cardiac resynchronization therapy defibrillator(CRTD) in situ. His SSc presented as chronic joint pain, limited skin sclerosis, interstitial lung disease(ILD) and pulmonary hypertension(PAH).

Key Steps:

- Cessation of immunosuppressant and stress dosing of steroids
- · Malignant Hyperthermia(MH) precautions and use of total intravenous anesthesia(TIVA)
- · Rapid sequence induction(RSI) in view of SSc related gastric reflux with train-of-four ratio(TOFR) monitoring
- CRTD programming
- Intraop TEE confirmed satisfactory valve function
- ROTEM done to correct coagulopathy related to SSc/cardiopul-

Discussion: In a patient with both EDMD and SSc. cardiac involvement such as conduction defects, cardiomyopathy and heart failure may be accelerated.^{1,2} Tricuspid valve dysfunction is significant in SSc, where right heart failure may be due to both PAH and direct cardiac fibrosis. Anesthesia considerations include optimisation of cardiorespiratory function, cardiac device management, early extubation and cardiopulmonary rehabilitation.

TIVA and avoidance of succinylcholine is necessary in view of susceptibility to MH or anaesthesia-induced rhabdomyolysis. Rocuronium for RSI and no further doses to avoid delay in muscle function recovery, prolonged weakness and post op respiratory complications. Residual blockade was noted at end of surgery despite single dose (TOFR 10% after 3hr surgery). TOFR was >90% prior to extubation in ICU.

References:

- 1. Heller SA, et al. Emery-Dreifuss muscular dystrophy. Muscle Nerve. 2020;61(4):436-448
- 2. Lambova S. Cardiac manifestations in systemic sclerosis. World J Cardiol. 2014;6(9):993-1005

Learning Points: In managing such complex patients, a multidisciplinary approach with thorough peri-operative planning can mitigate risks.

32AP08-2

Pharmacological support in patients undergoing left ventricular assist device implantation. First ten cases experience in our hospital

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Background and Goal of Study: The implantation of left ventricular assist devices (LVADs) has progressively increased as a bridge-to-transplant therapy as well as a destination therapy in patients with end-stage heart failure. Perioperative haemodynamic decompensations caused by a sudden decrease in left ventricular preload, an increase in left ventricular afterload, and elevated pulmonary vascular resistance are common and may precipitate right ventricular failure. After extracorporeal circulation (ECC) weaning, right heart failure may occur in up to 30% of patients, along with vasoplegia or cardiac arrhythmias.

The aim of this study is to describe and evaluate the use of pharmacological support in the first ten adult patients undergoing LVAD surgery in our hospital.

Materials and Methods: Retrospective study that included 10 adult patients undergoing LVAD placement. Descriptive statistics were generated to highlight the use of pharmacological support administered in these patients.

Results and Discussion: 10 HeartMate 3 were placed. Baseline sPAP were 44.70 ± 16.49 mmHg, LVEF 23 ± 6.18%, TAPSE 15.30 ± 2.49 mm. All patients received levosimendan before surgery. Pulmonary pressures were monitored during surgery with a Swan-Ganz catheter, ECG, SpO2, cerebral oximetry, BIS TM and TEE. Hemodynamic goals were MAP 65-80 mmHg, sPAP < 25 mmHg, CVP < 12 mmHg. Hemodynamic parameters obtained using a Swan-Ganz catheter, together TEE assessments of right ventricular size and contractility, were used as a guide to determine the need for inotropic or vasodilator therapy.

At the start of surgery, 100% of patients received inhaled nitric oxide, 90% nebulized prostacyclin and 50% intravenous sildenafil. Milrinone and dobutamine were administered in 10% and 100%, respectively. All patients received norepinephrine and vasopressin, and epinephrine was administered in 50%.

After withdrawal of cardiopulmonary bypass (CPB), one patient presented MAP <60 mmHg, with increased inotropic drugs, CVP >15mmHg, CI <2 L/min/m2, left septal deviation, and <4 L/ min LVAD flow at 2400 rpm, requiring placement of a right ventricular assist device. Inodilator and vasopressor therapy could be reduced after withdrawal of CPB. However, after surgery, all patients received norepinephrine and milrinone, 70% nitric oxide, 40% dobutamine, vasopressin and prostacyclin; and epinephrine and sildenafil were administered in 30%.

	Norepi- nephrine	Epi- neprhine	Vaso- pressin	Dobut- amine	Nitric oxide	Milrino- ne	lloprost	Silden- afil
Surgery	100%	50%	100%	10%	100%	100%	90%	50%
Post- surgery	100%	30%	40%	40%	70%	100%	40%	30%

Table 1: percentage of pharmacological support use in the intra and postoperative period of LVAD surgery.

Conclusion(s): The administration of vasopressor and inodilator therapy is important for these patients. This pharmacological support should be initiated before starting CPB, since placement of a LVAD may exacerbate right ventricular dysfunction.

Once ventricular support is established, the use of these agents should be reduced to the greatest extent possible. Furthermore, excessive afterload must be avoided, as it may lead to a decrease in LVAD flow.

32AP08-3

The role of NFAT pathway and shear stress on circulating T cells in the pathogenesis of calcific aortic valve disease

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Background and Goal of Study: Calcific aortic valve stenosis (AVS) is considered to be an active inflammatory disease. AVS is characterized by progressive fibro-calcific remodelling and thickening of the aortic leaflets causing severe cardiac outflow obstructions. Due to AVS progression circulating immune cells experience high shear stress (HSS), which is known to influence immune cell response (Baratchi et al. 2020).

In vivo T cell activation is a mechanical and biochemical process (Hope et al. 2022), in which Piezo1 as a mechanosensitive Ca2+permeable ion channel is involved. Ca2+ as an important 2nd messenger leads to T cell activation through nuclear translocation of the transcription factor nuclear factor of activated T cells (NFAT). The aim of this study is to explore the role of NFAT in HSS-induced T cell activation.

Materials and Methods: Blood was obtained from patients undergoing TAVI because of severe AVS. Circulating T cells were isolated using MACS-method. To model T cell activation in vitro Jurkat cells were activated by CD3/CD28 antibody stimulation and exposed to shear stress (20dyn/cm² and 200 dyn/cm²) for 3 hours. qPCR was performed for semiquantitative measurement of gene expression.

Results and Discussion: NFAT inducible genes are known to regulate T cell proliferation, differentiation and activation. Thus, we clustered them into genes responsible for proliferation and activation. The significantly elevated gene expression of Cyclin D1, IL2, IFNg along with TNFa in patients with AVS suggested the involvement of NFAT.

Acridine orange staining was used to assess whether HSS exposure impacts T cell viability. A 3-hour exposure to HSS did not result in a significant reduction in cell viability. Jurkat cells were subsequently exposed to HSS to evaluate any potential activating effect of HSS alone.

After 3 hours of HSS exposure no altered gene expression compared to static control was detected. The expression of IL2, IFNg. TNFa and Cyclin D1 increased only when HSS was used with antibodies together. Particular noteworthy is a gradual response to shear stress in the expression of IFNg.

Conclusion: HSS can enhance T cell activation when stimulated with CD3/CD28 antibodies. The NFAT pathway seems to be activated in HSS and AVS.

Reference:

Baratchi et al. Circulation 2020, 142 (11): 1092-1105; Hope et al. BMC Biology 2022, 20 (1): 61

32AP08-4

Unique anaesthetic protocol for successful management of OPCAB in patient with Addison's disease (due to adrenal gland tuberculosis) and left ventricular aneurysm

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Background: Addison's disease combined with cardiovascular disease is infrequent only 10 cases in the literature. Addison's disease due to dysfunction of the adrenal gland, with abnormal secretion of glucocorticoids and mineralocorticoids, is rare. By inducing inflammation and disorder of water and electrolyte metabolism, Addison's disease may accelerate progression of coexisted CAD(1).

Case Report: 60 yr old male, was admitted with c/o breathless & angina on exertion, he is a k/c/o CAD with PTCA done to Left Circumflex & Ramus Intermediate in past. He is also a k/c/o HTN, DM & Hypothyroidism and on medical management.

In 1994 patient was diagnosed with Pulmonary Tuberculosis & Potts spine for which he was give anti-tubercular drugs for 12 months, same year he also c/o facial swelling & extreme tiredness, investigated & Addison's disease was diagnosed due to adrenal gland tuberculosis thereafter, patient is life-long on T.Wysolone 5mg to 10mg OD. Investigation: S. Cortisol < 0.07.

Discussion: Addison's disease caused by adrenal gland tuberculosis is very rare in developed nations but is seen in developing countries, patients are life-long on steroids to prevent Addisonian crisis and the disease is know to accelerate CAD in patients. OP-CAB is a challenging task to the surgeon during lateral & posterior wall grafting so the role of cardiac anaesthetics in maintaining optimal vitals during these grafts is pivotal, so to say hypertension & tachycardia are unacceptable conditions & this will lead to conversion from OFF to ON-Pump CABG (3).

As cardiac anaesthetist with in-depth knowledge of various drugs available we can create a "milieu" that can avoid cardiac pump, such as in this particular case, where avoiding pump & cardioplegia was a necessity, because of fluid overloading, electrolyte imbalances which could lead to grave complications of, "Addisonian crisis"(2) with increased mortality to the patient.

References:

- 1. Ruohan Zhao et. al, Coronary artery disease in a patient with Addison's disease: a case report and literature review, BMC Cardiovascular Disord. 2023 Jan 29.
- 2. Celma D'Silva et. al, A strategy for management of intraoperative Addisonian crisis during coronary artery bypass grafting, Interact Cardiovasc Thorac Surg. 2012 Jan
- 3. Khuzaima Tariq et.al, Conversion from Off to On-Pump Coronary Artery Bypass Grafting. Is it Avoidable? Cureus. 2020 Jan 27.

Learning Points: Meticulous choice of drugs.

The functional status of the heart and coronary blood flow during the induction of anesthesia in elderly patients with coronary heart disease

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Background and Goal of Study: With the global trend of population aging, modern medicine faces the urgent task of improving healthcare for elderly patients. This group often presents with reduced compensatory reserves and multiple chronic conditions. necessitating a more meticulous approach by anesthesiologists. The goal of this study was to evaluate the functional status of the heart and coronary blood flow in elderly patients with coronary heart disease (IHD) during the induction of anesthesia using various anesthesia methods.

Materials and Methods: This prospective, randomized cohort study included 60 patients (ASA III-IV; mean age 66.8±5.3 years) undergoing off-pump coronary artery bypass grafting (CABG). Participants were divided into two groups based on the induction agent used: Group 1: Propofol 1.5 mg/kg; Group 2: Propofol 1.5 mg/ kg plus ketamine 0.5 mg/kg. For analgesia, fentanyl (2.0 µg/kg) was administered in both groups, with neuromuscular relaxation achieved using pipecuronium bromide (0.1 mg/kg). Hemodynamic parameters, including stroke index (SI), ejection fraction (EF), cardiac index (CI), systemic vascular resistance index (SVRI), and coronary perfusion index (CPI), were recorded at four stages: 1. Upon arrival in the operating room (Stage I); 2. Before tracheal intubation (Stage II): 3. Immediately after intubation (Stage III): 4. 25 minutes post-intubation (Stage IV).

Results and Discussion: A statistically significant difference in SI was observed between groups at Stage III (31.96±4.07 mL/m² vs. 35.16±4.52 mL/m², p=0.0213) and Stage IV (27.83±3.7 mL/m² vs. 34.61±3.73 mL/m², p=0.00112). A significant difference in EF was found at Stage IV (43.78±6.18% vs. 52.86±5.78%, p<0.001). CI showed statistically significant differences at Stage III (2.39±0.3 $L/min/m^2$ vs. 2.69±0.45 $L/min/m^2$, p=0.02104) and Stage IV (1.97±0.3 L/min/m² vs. 2.63±0.34 L/min/m², p=0.00120). Significant differences in SVRI were noted at Stage II (2853.03±554.4 dyn·s·cm⁻⁵·m² vs. 3250.04±622.9 dyn·s·cm⁻⁵·m², p=0.0112). CPI also showed significant differences at Stage II (0.6±0.03% vs. 0.65±0.04%, p=0.0411) and Stage IV (0.69±0.01% vs. 0.77±0.03%, p=0.0011).

Conclusion(s): The addition of ketamine to a traditional propofolfentanyl combination in elderly patients with coronary heart disease improves the coronary perfusion index during induction of anesthesia and reduces the cardiodepressive effect of propofol on cardiac functional status.

32AP08-6

Differences in incidence of post-induction hypotension depending on the time of day: a post-hoc propensity score matched analysis

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Background and Goal of Study: Many physiological processes show a diurnal rhythm, including sympathetic and parasympathetic tone, adrenal hormone secretion and blood pressure (BP). Since these physiological rhythms may affect the sensitivity to anaesthesia, we hypothesized that the time of day when anaesthesia induction occurs may affect the incidence of PIH.

Materials and Methods: This was a post-hoc propensity score matched analysis of prospectively collected BP data of 750 elective non-cardiac surgery patients receiving general anaesthesia. The primary endpoint was the incidence of PIH, defined as mean arterial pressure (MAP) < 65 mmHg for at least one minute. Secondary endpoints were a >30% decrease in MAP, and baroreflex sensitivity.

Results and Discussion: In the analysis of 237 propensity score matched pairs, PIH was more frequent if anaesthesia induction occurred in the morning (before 12:00 PM) (OR 1.48, 95% CI: 1.00 -2.20, p = 0.049).

Secondary analyses of the matched cohort showed that a >30% decrease in MAP was likewise more frequent in the morning than the afternoon (after 12:00 PM) (OR 1.45, 95% CI: 1.00 - 2.11, p= 0.050), but no differences in baroreflex sensitivity were observed. Conclusion(s): In this post-hoc propensity score matched analysis, PIH was more frequent after anaesthesia induction in the morning compared to the afternoon. While this finding is in line with the presumed physiological mechanisms, it may be affected by unmeasured confounding.

These findings should be replicated in larger, preferably randomized, studies to evaluate whether a causal relationship between the time of day of anaesthesia induction and PIH exists.

Opioid free anaesthesia-analgesia strategy in elective open abdominal aortic aneurysm repair: can it attenuate the stress response? Preliminary findings from a prospective randomized study

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Background and Goal of Study: The surgical stress response in open Abdominal Aortic Aneurysm (AAA) repair is significant. This study investigates if a perioperative Opioid-Free Anaesthesia-Analgesia (OFA-A) approach can effectively mitigate this stress response compared to the conventional Opioid-Based Anaesthesia-Analgesia (OBA-A).

Materials and Methods: Forty patients undergoing open infrarenal AAA repair were randomized in 2 groups, managed by OFA-A or OBA-A strategy. Blood inflammatory markers (IL-6, IL-8, IL-10, TNF-\(\Pi\), CRP, cortisol, AVP, WBC) were analysed at 4-time points. Haemodynamic data were recorded every 20 seconds intraoperatively. Parametric data were assessed via unpaired t-test and non-parametric data via Mann-Whitney U test. P-values for inflammatory markers and haemodynamic data were corrected with False Discovery Rate method (Q=5%) to ensure robustness

Results and Discussion: Preliminary data from 32 patients (16 in each group) show significant differences in cortisol (P=0.009, q=0.013), CRP (P=0.008, q=0.013), IL-6 (P=0.004, q=0.013) and IL-8 (P=0.014, q=0.015) 24 hours after clamp release (higher in OBA-A group). WBC, AVP, IL-10, and TNF- showed no significant differences at any time point.

Both groups received goal-directed fluid therapy with no significant differences in noradrenaline, phenylephrine, ephedrine, or fluid requirements. However, OFA-A patients had higher intraoperative urine output (P=0.003) and lower furosemide requirement (P=0.0007).

Haemodynamic data from 30 patients (14 OFA-A, 16 OBA-A) showed no significant differences in haemodynamic instability (defined as HR or BP ≥120% or ≤80% of baseline values, lasting ≥1 minute). The coefficient of variation (CV) for systolic BP (SBP) (P=0.022, q=0.025) and pulse pressure (PP) (P=0.023, q=0.025) was significantly lower in OFA-A group. The CV for HR, diastolic BP (DBP), and mean BP (MAP) showed no significant differences. The Average Real Variability of the averaged 5-minute values for SBP (P=0.003, g=0.008), MAP (P=0.053, g=0.047), HR (P=0.009, g=0.016), and PP (P=0.001, g=0.006) also showed statistically significant differences in favour of OFA-A.

Conclusion(s): Preliminary data suggest that the stress response in OFA-A group was attenuated, with less haemodynamic fluctuation. If these findings are confirmed in the final analysis, they could influence the management of surgical stress in open AAA repair and potentially other surgical procedures.

32AP08-8

The effect of HuaXi-1 cardioplegia on the whole heart ischemia/reperfusion injury in on-pump cardiac surgery: a retrospective cohort study

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Background and Goal of Study: Cardioplegic solutions arrest the heart during cardiopulmonary bypass to provide a stable surgical field but may cause ischemia/reperfusion injury. Effective solutions are key to reducing myocardial damage and aiding postreperfusion recovery. HuaXi-1 (HX-1), developed by West China Hospital, has been used clinically for 17 years without systematic evaluation.

This study compares its cardioprotective effects with the Histidine-Tryptophan-Ketoglutarate (HTK) solution.

Materials and Methods: This retrospective cohort study included adult patients undergoing cardiac surgery with cardiopulmonary bypass at West China Hospital and Guangdong Provincial People's Hospital between January 1, 2019, and June 30, 2021. Patients were divided into HX-1 and HTK groups based on the cardioplegia administered.

The primary outcome was defined as the incidence of major adverse cardiac events (MACE) from the day of surgery to discharge, including in-hospital death, extracorporeal membrane oxygenation (ECMO) support, or intra-aortic balloon pump (IABP) support.

Propensity score matching was applied to control for confounding variables, and logistic regression analysis was conducted to investigate the association between HX-1 and the risk of postoperative MACE. Subgroup analyses assessed the protective effects of HX-1 across various patient populations.

Results and Discussion: In the entire cohort, the HX-1 group exhibited a relatively lower risk of postoperative MACE (OR 0.16, 95%CI 0.11-0.24), including in-hospital mortality (OR 0.37, 95%CI 0.21-0.64), ECMO support (OR 0.15, 95%CI 0.07-0.30), and IABP support (OR 0.05, 95%CI 0.02-0.10) . After propensity score matching, the HX-1 group sustained a lower risk of postoperative MACE (OR 0.45, 95%CI 0.25-0.81).

Logistic regression analysis indicated a significant association between HX-1 usage and decreased postoperative major adverse events (OR 0.43, 95%CI 0.22-0.83).

Besides, HX-1 group showed lower troponin T levels, shorter total hospital stays, and postoperative hospitalization duration across all patients; these advantages persisted in the matched cohort (all P<0.001).

Conclusion(s): HX-1 cardioplegia effectively reduces the risk of postoperative MACE (including all-cause mortality, ECMO, and IABP) compared to HTK, demonstrating superior myocardial protection against ischemia/reperfusion injury. Large-scale, multicenter, randomized controlled trials are needed to validate these findings.

Hemodynamic and echocardiographic considerations to prevent left atrial appendage closure device migration: case report

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Background: Percutaneous closure of the left atrial appendage (LAA) is not without complications, one of which is the migration of the LAA closure device to the mitral valve1. Migration of the device to the aorta is very rare.

Case report: A 54-year-old patient with anticoagulated atrial fibrillation and recurrent gastrointestinal bleeding with severe anemia (Hb 6.3 g/dl) required the implantation of an Amplatzer™ Amulet™ (28 mm) device in the LAA using the Sandwichtzerm technique under transesophageal echocardiography (TEE) and angiographic control with midazolam and fentanyl. Two days later, the patient developed progressive dyspnea, SpO2 85%, and sPAP of 45 mmHg.

Echocardiography diagnosed severe aortic insufficiency due to device migration, and surgical extraction was decided over percutaneous extraction due to the risk of valve injury and further migration of the device. At the beginning of surgery, the patient presented with BP 147/72 mmHg, HR 95-100 bpm, SpO2 92% (FiO2 0.35).

Anesthetic induction was performed with 20 mg midazolam, 0.15 mg fentanyl, and 70 mg rocuronium, followed by a norepinephrine infusion to maintain a MAP ≥ 60 mmHg. TEE confirmed device impaction on the aortic valve, causing severe aortic insufficiency, as well as perforation and prolapse of the non-coronary leaflet. After surgery, the patient was transferred to the ICU.

Discussion: The size of the LAA can vary depending on the patient's hydration status, and anemia and hypovolemia may have led to inaccurate measurements of the LAA structure, thereby facilitating device migration. The lobe of the Amplatzer™ Amulet™ device should be implanted 10-15 mm from the ostium of the LAA, with the disc completely covering the ostium.

1. Jose M González et al. Can J Cardiol 2013;29:1532.e5-7

Learning points: LAA closure device implantation should be performed under normovolemic conditions. A certain degree of device oversizing is also preferable, as it minimizes residual leak rates without increasing the risk of wall rupture. TEE is crucial for proper device selection and implantation, as well as for diagnosing and monitoring device migration.

On the other hand, although device migration typically does not extend beyond the mitral valve, the possibility of migration to the aorta must also be considered, even in patients without significant hemodynamic repercussions.

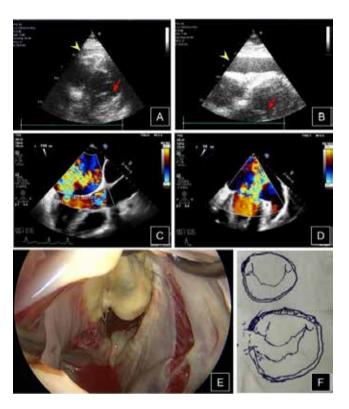
32AP08-10

Mitral annular disruption with severe mitral regurgitation and acute heart failure following blunt chest trauma

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Background: Blunt chest trauma rarely induces valve injuries, with the majority involving papillary muscle or chordae rupture. Here we present a patient who underwent cardiorrhaphy after trauma but developed severe mitral regurgitation (MR) and heart failure due to an initially missed mitral annular lesion.



Case report: A 76-y/o man with HTN, congestive heart failure, Afib, COPD sustained a 3-meter fall onto his right torso. He was transferred to a tertiary center due to shock. In ER, he was conscious and relatively stable after resuscitation. CT revealed fractures in the right scapula, right ribs, pericardial effusion.

TTE confirmed hemopericardium (Fig A-B, arrowhead) with tamponade but normal mitral valve motion with coaptation (arrow). Urgent sternotomy repaired a left atrial base laceration.

Despite shock management, he developed pulmonary edema and hemodynamic instability.

Repeat TTE revealed severe MR, four-chamber dilatation, ventricular decompensation.

Urgent mitral valve repair was performed. Intraoperative TEE showed severe MR without leaflet coaptation (Fig C-D), severe tricuspid regurgitation, and a 25% LVEF. Surgical findings showed mitral annular rupture and anterolateral commissure distortion (Fig E-F). He underwent mitral ring annuloplasty with LVAD and ECMO support, and was transferred to the ICU. LVAD was removed on POD9: He was extubated on POD12.

Discussion: Only few cases exist regarding mitral annular disruption after falls; Surgery depends on patients' tolerance.1,2 The injury mechanism remains unclear, possibly involving increased intracardiac pressure or direct impact.1-3

In our case, the initial TTE showed normal mitral valve coaptation, assuming MR developed later due to progressive chamber dilation from decompensated heart failure, which aggravated an initially occult annular disruption.

Pre-existing heart failure may have predisposed our patient to the rapid decompensation.

References:

- 1. Tex Heart Inst J. 2015 Dec 1;42(6):579-81
- 2. Circulation. 2015 Jul 14;132(2):e14-5
- 3. Trauma Case Rep. 2022 Aug 1:41:100681

Learning points: This emphasizes the importance of point-of-care echocardiography to evaluate heart function following trauma

32AP08-11

Stellate ganglion: beyond pain: a therapeutic alternative for arrhythmic storm

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Background: The management of recurrent ventricular arrhythmias in patients with dilated cardiomyopathy is often challenging for physicians. Ultrasound-guided stellate ganglion block (SGB) is a minimally invasive, simple, and safe therapeutic alternative.

Case report: A 48-year-old male with a history of dilated cardiomyopathy of unknown etiology initially presented with cardiac arrest, requiring ECMO support. Subsequently, he experienced several episodes of AS, necessitating shocks from the implantable cardioverter-defibrillator (ICD).

Following the last episode of sustained ventricular tachycardia with associated dizziness and palpitations, an ultrasound-guided SGB was proposed in the operating room using a lateral cervical approach, with administration of 20cc of 0.25% Bupivacaine. Four months later, stabilization of rhythm and symptoms was reported.

Discussion: SGB is used as a therapeutic tool for complex regional pain syndrome of the upper limb and trigeminal neuralgia, eliminating sympathetic innervation of the affected area. Left-sided sympathetic fibers innervate the AV node, the His bundle, and the ventricular myocardium, which serve as the substrate for most ventricular arrhythmias. When conventional treatments for these arrhythmias fail, as in the case described, SGB is considered a rescue technique.

The advantage of performing the procedure under ultrasound guidance with a lateral approach to the vascular bundle lies in its safety, avoiding the risk of vascular complications in these patients, who are often anticoagulated.

However, its limitations include limited evidence of long-term efficacy, as our patient was only followed for four months. Regarding the local anesthetic dose, the optimal amount to achieve prolonged effect while minimizing spread to adjacent neural structures remains unknown.

Nevertheless, favorable outcomes reported in case series, as well as the clinical benefit observed in the proposed case, suggest this technique as a rescue alternative for AS, avoiding more invasive measures such as thoracic epidural anesthesia or thoracoscopic sympathectomy.

References:

Ganesh A, et al. Stellate Ganglion Blockade: an Intervention for the Management of Ventricular Arrhythmias. Curr Hyp Rep. 2020 Oct 23:22(12):100

Learning points: Ultrasound-guided SGB with a lateral approach to the cervical vascular bundle is presented as a safe and effective technique for stabilizing cardiac rhythm in patients with AS refractory to conventional treatment.

32AP08-12

Dynamic approach with ECMO as a bridge to lung transplantation

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Background: ECMO (extracorporeal membrane oxygenation) provides temporary cardiopulmonary support for critically ill patients unresponsive to medical therapy. Its use requires dynamic adjustments based on clinical changes. This case illustrates ECMO's multimodal application during a complex perioperative period.

Case Report: A 58-year-old male with familial idiopathic pulmonary fibrosis managed with Nintedanib and home oxygen. He presented with severe respiratory failure unresponsive to high-flow oxygen. VV (veno-venous) ECMO was initiated in the ICU as a bridge to lung transplantation.

Perioperative Course

Preoperative: Severe right ventricular dysfunction developed despite VV ECMO, necessitating conversion to VAV (veno-arteriovenous) ECMO, delivering 2.2 L/min to the internal jugular vein and 1.3 L/min to the femoral artery. Hemodynamic stability improved. VA (veno-arterial) ECMO was avoided due to preserved left ventricular function, preventing Harlequin syndrome (upper body hypoxia).

Intraoperative: Lung transplantation proceeded with cardiopul-monary bypass.

Postoperative: Right ventricular function improved, confirmed by echocardiography and pulmonary artery catheterization. ECMO was transitioned back to VV mode on postoperative day five to support lung adaptation.

Outcome: Decannulation occurred on day seven after successful weaning. The patient was discharged from the ICU on day twelve with supplemental oxygen and thoracic drainage tubes.

Discussion: This case highlights the strategic, multimodal use of ECMO to address the patient's evolving clinical needs. VV ECMO was employed initially for respiratory failure, then converted to VAV ECMO due to right ventricular dysfunction. VA ECMO was avoided to prevent Harlequin syndrome. ECMO cannulas were effectively utilized during cardiopulmonary bypass and in the immediate postoperative period, reverting to VV ECMO after right ventricular recovery.

This case underscores the importance of ECMO's adaptability in complex perioperative management.

References:

Hoetzenecker K, Benazzo A, Stork T, et al. Extracorporeal life support in lung transplantation, J Thorac Dis. 2018:10(Suppl 15) Granton J. Cheng D. Transitioning between VV and VA ECMO in perioperative lung transplant complications. Chest. 2020:158(5):1874-1882

Learning Points:

- ECMO's adaptability is crucial in dynamic perioperative manage-
- · Continuous hemodynamic monitoring enables tailored interventions.

32AP08-13

External and internal validation of a multivariate multimodal voting machine learning model of intraoperative hypotension

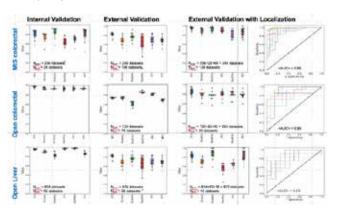
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Background: Intraoperative hypotension (IOH) is associated with significant postoperative morbidity.[1]

We previously demonstrated reliable IOH prediction using a multivariate random forest: static scenario: 11-fold cross-validation machine learning model in the context of open liver lobectomy.[2] In this work, we extend the method to colorectal and minimally invasive liver surgery, present external validation of the method by testing with a publicly available dataset, and investigate the ability to localize the model by re-training with a subset of data from the external database.

Methods: Data analysis was performed under an Institute Review Board approved protocol and according to the declaration of Helsinki's ethical principles for medical research involving human subjects. Internal validations were performed in a patients undergoing minimally invasive (MIS) and open liver resections and colorectal surgeries in our institution. External validations were done using the Machine Learning Outcome Validation and Evaluation Resource (MOVER) database.[3]

External validation following localization was also performed using MOVER. Model performance was evaluated using the following metrics: area under the curve (AUC), accuracy, sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV).



Results: In the MIS colorectal surgery context (n=284), internal validation performance was acceptable (AUC=0.85, Figure). The model generalized reasonably well directly to external data (n=198), localization with a small amount of external data vielded strong performance (AUC=0.95). For colorectal open (n=812), internal validation was strong (AUC=0.95, Figure 2).

External validation for open colorectal (n=55) and liver resections (n=17), did not generalize well directly (Figure), likely related to small populations to permit localization.

Conclusion: Internal and external validations of our novel ML model show moderate to strong performance. However, there was insufficient data in MOVER for external validation in the open colorectal and MIS liver context. There is a need for larger datasets for external validation with localization.

32AP09-1

Opioid-sparing anaesthesia in thymectomy using ultrasound-guided bilateral deep parasternal block: a case report

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Background: The novel bilateral deep parasternal block (DPB), is emerging as a valuable tool in cardiothoracic surgeries, including thymectomy, a procedure often associated with significant postoperative pain.

In this case report, the block was implemented preoperatively, demonstrating its potential to facilitate opioid-sparing anesthesia and perioperative pain management.

To our knowledge, this is the first report of its preoperative application in thymectomy.

Case Report: A 53-year-old male (BMI 29.1) with a history of substance use (marijuana, cocaine, alcohol abuse, 40 pack-years smoking) and psychotic disorder (on quetiapine and zopiclone) presented for elective thymectomy following a diagnosis of thymoma. Preoperative cardiologic echocardiography and laboratory tests were unremarkable.

The anesthesia plan included general anesthesia (GA) induction with fentanyl (0.2 mg), propofol, and rocuronium, combined with a bilateral DPB under ultrasound guidance (40 mL 0.375% ropivacaine total). GA was maintained with sevoflurane and additional analgesia consisted of paracetamol (1000 mg), dexamethasone (8 mg), magnesium sulfate (2500 mg), parecoxib (40 mg), and dexmedetomidine (100 mcg).

No additional opioids were administered intraoperatively. The surgery was performed via median sternotomy and lasted 90 minutes. Nociception and depth of anesthesia were intraoperatively monitored.

The patient remained hemodynamically stable throughout the procedure and was extubated promptly postoperatively. He was transferred to the post-anesthesia care unit for one hour and subsequently to the cardiothoracic ward.

Postoperative analgesia included paracetamol (1000 mg every 6 hours) and rescue tramadol as needed. The patient required 200 mg of tramadol on the 1st postoperative day, experienced no complications, and was discharged on the 4th postoperative day with satisfactory pain control and recovery.

Discussion: Thymectomy poses a risk of significant postoperative pain, necessitating effective analgesia to optimize recovery. DPB offers a safe, effective and promising method for reducing opioid reliance and their associated side effects, for contributing to stable hemodynamics, high-quality multimodal analgesia, and high quality of recovery.

Learning points: Preoperative DPB enhances analgesia and recovery after thymectomy. DPB is safe, simple and effective in reducing perioperative opioid use, while improving patient outcomes and satisfaction in cardiothoracic surgeries.

32AP09-3

Management of post operative complications in Jehovah's Witness patient after complex open cardiac surgery

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Background: Open cardiac surgeries in Jehovah's Witness patients are challenging due to inability to perform blood transfusions in case of hemorrhagic events. To minimize postoperative risks, it is important to reach pre-op Hb level of at least 12 g/dL. Here we demonstrate management of post-op complications in Jehovah's Witness patient undergoing complex valvular surgery along with LVAD implantation.

Case Report: A 56-year-old woman was admitted to the ICU with severe dyspnea, tachycardia, sharp decrease in exercise tolerance. She refused blood transfusions being Jehovah's Witness. Past history included: chronic rheumatic heart disease, AFib, MICS with mitral, aortic valves replacement and tricuspid valve repair (2008), ICD implantation (2016). In June 2023, she decompensated further and was hospitalized for aortic and mitral valves implantation along with LVAD. Cell saver was set up immediately after surgery. Post-op period proceeded with AKI, acute anemia (Hb 5.6 g/dL vs. 133 g/dL), hydrothorax, sepsis. She received treatment of severe anemia by 100 mg of Fe (III) i.v. daily. Pleural puncture proceeded with removal of 1600 ml fluid. Extracorporeal hemocorrection was performed for 4 days (HDF + HA) due to sepsis. Antibiotic therapy was selected. Hypoproteinemia (TP 5.28 g/dL, albumin 2.61 g/dL) was corrected by enteral nutrition. MAP of 70-80 mmHg was mainteined (flow=3.3 L/min, pump speed=4700 rpm). Over the course of ICU stay, her condition improved, Hb level (6.8 g/dL) rised and she was transferred to the department of cardiology.

Discussion: We demonstrated successful management of postop complications such as severe anemia, hypoproteinemia, AKI, hydrothorax and sepsis in a 56-year-old Jehovah's Witness that underwent implantation of aortic, mitral valves and LVAD. Although blood and albumin transfusion may accelerate recovery, current management was as effective resulting in complications resolution during 10 days.

Learning points: Jehovah's Witness patients require different approach of hemostasis correction in perioperative period. This poses additional mortality and morbitiry risks. In the current scenario, multidirected approach applied to the patient during postoperative period resulted in a successful patient's recovery. «This research is funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (Grant No. AP19677596)»

32AP09-5 AF ablation rare complication gone right

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Background: Air embolism is a rare but dreadful complication of invasive medical procedures.(1) We present a case of transseptal puncture for atrial fibrillation (AF) ablation complicated with air stroke and its multidisciplinary approach.

Case Report: A 48-year-old female patient was submitted to an AF ablation procedure under general anesthesia. Immediately following extubation, the patient presented with aphasia and right-sided quadriparesis. High-flow oxygen was initiated, and Computed Tomography angiography and magnetic resonance imaging were performed, showing recent ischemia, but no significant changes in the major cervical or intracranial vessels, including occlusions. The diagnosis of ischemic stroke was established, likely attributed to air embolism and the patient was transferred to an hyperbaric chamber. She was discharged 3 days later with minor sequelae.

Discussion: Cerebral air embolism is rare but may result in severe neurological impairments, including stroke, anoxic brain injury or death.(1,2) During ablation procedures, several mechanisms are potential sources of air entry into circulation and the passage of air from the venous to the arterial system can occur through shunts or incomplete filtration in the pulmonary capillaries.(2) Air embolism requires immediate intervention such as identifying the entry point as expediently as possible by repositioning the patient or endovascular aspiration. To reduce potential ischemia and the size of air bubbles, high-flow oxygen must be implemented, preferably in a hyperbaric chamber, as it creates an hyperoxic environment and increases the solubility of air in the plasma.(3) Prompt suspicion and recognition by the anesthesiologist together with multidisciplinary team of cardiologists and neurologists allowed an unusual almost complete recovery.

References:

- 1. Procedure-Related Complications of Catheter Ablation for Atrial Fibrillation. J Am Coll Cardiol. 2023 May;81(21):2089-99. 2. Cerebral Air Embolism Resulting from Invasive Medical Procedures Treatment with Hyperbaric Oxygen. Ann Surg. 1985 Feb;201(2):242-5.
- 3. Hyperbaric Oxygen: Its Mechanisms and Efficacy. Plast Reconstr Surg. 2011 Jan;127:131S-141S.

Learning points: Air embolism requires high suspicion levels from the anesthesiologist for diagnosis as well as prompt intervention, as the prognosis is time sensitive.

32AP09-6

Perioperative challenges in acute aortic thrombosis: Ischemia-reperfusion injury leading to cardiac arrest

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Background: Acute aortic thrombosis is a rare, but life-threatening condition. Rapid revascularization is essential to minimize ischemic damage, but post-revascularization complications, as ischemia-reperfusion injury and metabolic disturbances, often compromise outcomes.1

Anesthetic management plays a crucial role during these highrisk interventions.

Case Report: A 58-year-old male, ASA IVE, with a history of hypertension, type 2 diabetes mellitus, obesity and chronic alcohol abuse presented with acute bilateral lower limb ischemia secondary to infrarenal aortic thrombosis. He also had myocardial ischemia suggestive of Takotsubo syndrome. Vascular surgery proposed an emergency thromboembolectomy.

The patient was hemodynamically stable but had a severe pain and hypoxemia requiring supplemental oxygen. A general anesthesia was induced with continuous invasive arterial pressure monitoring. Short after, he necessitated a low dose of vasopressor support. Surgery partially restored bilateral lower limbs perfusion, shortly, the patient developed ischemia-reperfusion syndrome with metabolic derangements (hyperkalemia) requiring urgent correction.

Despite aggressive treatment, the patient developed refractory bradycardia, diffuse ST-segment elevation, and worsening hemodynamic instability, culminating in cardiac arrest - asystole. Six cycles of advanced life support restored spontaneous circulation, with arterial blood gases analysis showing severe acidosis and hyperkalemia. Given extensive arterial disease and prolonged arrest, the patient was deemed unsuitable for extracorporeal membrane oxygenation.

Surgery was interrupted, and the patient was transferred to the ICU. Complications included rhabdomyolysis, acute kidney injury and hypoxic-ischemic encephalopathy.

Discussion/Learning points: This case illustrates the intricate challenges of anesthetic management in acute aortic thrombosis, where hyperkalemia emerged as a critical factor in perioperative cardiac arrest, compounded by ischemia-reperfusion and severe metabolic disturbances.

Differentiating hyperkalemia-induced cardiac arrest from acute myocardial infarction was important because precise diagnosis enabled targeted interventions for effective resuscitation, however both could contribute to arrest.

Reference:

1-Kaschwich, Mark et al. "Management of acute aortic thrombosis." The Journal of cardiovascular surgery vol. 58,2 (2017): 313-320. doi:10.23736/S0021-9509.16.09798-6

32AP09-7

Serratus anterior plane block in transaxillary valve replacement for ERAS application

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Background and Goal of Study: One of the criteria for application of ERAS protocol in patients undergoing minimal invasive valve surgery is the efficient pain management. The incision is performed usually in the area of 3rd or 4th intrercostal space. which receives rich innervation from the long thoracic and thoracodorsal nerve. Successful perioperative pain control is essential for less opioid consumption, less pain and stress and early extubation.

We report our experience of 60 patients undergoing valve surgery with right transaxillary thoracotomy under general anesthesia and serratus anterior plane block-SAPB.

Materials and Methods: Patients were admitted for elective aortic valve replacement through right transaxillary access. Anesthesia was induced with midazolam 4mg, fentanyl 2-3mcg/kg and rocuronium 0,6mg/Kg. Anesthesia was maintained with dexmedetomidine 0.7mcg/Kg/min and sevoflurane was adjusted in order to maintain a BIS value between 40 and 50. The block was performed under ultrasound guidance. The needle was placed in the 3rd and 4th intercostal space between serratus anterior muscle and pectoralis major muscle in order to block thoracodorsal and long thoracic nerve. A single injection of 10ml 0,5% ropivacaive in each space is adequate.

Before the end of the operation, following rib approximation, we introduce a continuous infusion catheter with 0,2% ropivacaine at a flow rate of 7-12 ml/h. Postoperative experience of pain was measured using a numerical pain scale (NRS 11[Numeric Rating Scale]).

Results and Discussion: 37 patients who underwent transaxillary valve surgery were enrolled in this study, 22 men and 15 women with mean age: 67.7±7.3. Time of extracorporeal circulation was 105± 18.5min and the aortic cross clamping time (Xclamp) was 60±15min. Total intraoperative fentanyl requirements were 0,4-0,7mg (0,2-0,3mg were administered at induction of anesthesia). All patients received 100mg tramadol at the end of the procedure. 10 patients were extubated in the operating room while the others in the following hours. None of them received opioids postopera-

Conclusion(s): Preemptive analgesia and treatment of pain is of particular importance for early extubation and rehabilitation of a patient undergoing valve surgery through thoracotomy. The serratus anterior plane block is a safe option to block the nerves that innervating the lateral thoracic wall, providing a postoperative course free of pain and opioids.

32AP09-10

Successful extracorporeal cardiopulmonary resuscitation and transcatheter aortic valve replacement in a patient with severe aortic stenosis

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Background: Severe aortic stenosis is the most common valvular disease associated with a high mortality. Around three per cent of elderly people who reached 65 years suffer from aortic stenosis [1]. Causes include congenital (bicuspid/unicuspid valve), calcification, and rheumatic disease. Cardiogenic shock is one of the most serious complications before and during transcatheter aortic valve replacement (TAVR) procedures.

Case Report: A 58-year-old woman was admitted to an ICU complaining on severe dyspnea, chest pain, and mental confusion. Past medical history included: symptoms duration for 2 years, PCI, DM II, BMI41 kg/m2.

Physical exam revealed systolic murmur in the 2nd ICS along the right sternal border. ECG demonstrated sinus rhythm with STsegment depression in anterior and posterior leads. TTE parameters: LVEDV - 95 ml, EF - 52%; AV MG- 85.0 mm Hg. Thirty minutes min after admission refractory VF and cardiac arrest started. CPR was initiated.

Activities performed: Intubation, CPR (40 min), vasoactive and inotropic support, and then VA-ECMO. Peripheral VA-ECMO was implanted with technical difficulties due to patient's obesity. VF still persisted. On full ECMO, with vasoactive and inotropic drugs along with mechanical chest compressions, angiography ruled out any acute events.

Urgent TAVR was conducted. TEE final showed minimal paravalvular regurgitation. After TAVR, the patient was transferred to the ICU.

On the 2nd day: improved general condition, no neurological complications.

On the 3rd day: ECMO was explanted, duration comprised 2 days. On the 4th day: the patient was extubated and transferred from the ICU the following day.

Discussion: Patients with severe aortic stenosis should be closely monitored, especially in case of concomitant coronary artery disease which can deteriorate into refractory VF und cardiogenic shock. Application of ECMO is a preventative and protective for hemodynamics support during transcatheter aortic valve replacement.

Reference:

References: 1. Grimard, B., Safford, R., Burns, E. 'Aortic Stenosis: Diagnosis and Treatment' Am Fam Physician. 2016;93 (5):371-

Learning points: Successful ECPR with TAVR allowed complete patient's recovery in a short term without neurological complications

«This research is funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (Grant No. AP19677596)»

32AP09-11

Challenges in balancing cardiac and renal care: A case of post-CABG deterioration linked to LIMA graft flow and AV fistula dynamics

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Background: This case highlights the challenges of managing high-risk cardiac surgery in a patient with end-stage renal disease (ESRD) on hemodialysis via an arteriovenous (AV) fistula. A 71-year-old male with prior myocardial infarction (MI), multiple percutaneous coronary interventions (PCI), non-ST-elevation MI (NSTEMI), atrial fibrillation on novel oral anticoagulants (NOAC), and type 2 diabetes mellitus (T2DM) underwent elective coronary artery bypass grafting (CABG) with left internal mammary artery (LIMA) to left anterior descending artery (LAD) grafting, left atrial appendage occlusion, and ascending aorta replacement for a dilated aorta.

Case Report: Preoperative discussions addressed the risk of AV fistula dysfunction due to LIMA grafting. Postoperatively, the patient was stabilized on minimal noradrenaline support in the intensive care unit (ICU) and managed with continuous venovenous hemofiltration (CVVH) via a new right internal jugular vein vascath. After six days in the ICU, he was transferred to the ward, and dialysis resumed via the left AV fistula.

On postoperative day 10, the patient developed cardiogenic shock with poor left ventricular (LV) function and global hypokinesia, raising concerns about LIMA graft flow compromise.

Discussion: This case underscores the potential for AV fistula use to impact LIMA graft flow due to vascular steal or other hemodynamic factors, particularly in patients with ESRD.

While LIMA grafting offers long-term patency, its interaction with AV fistulas poses risks that are not fully addressed in current literature. A multidisciplinary approach and close monitoring are crucial to identify and address such complications.

References:

- 1. Loop FD et al., "Influence of the internal-mammary-artery graft on long-term survival after coronary artery bypass grafting,"
- 2. Galla JD et al., "Outcomes of coronary artery bypass grafting in hemodialysis patients," Circulation, 2004.
- 3. Watanabe Y et al., "AV fistula-related vascular steal and its impact on coronary artery bypass graft flow," Journal of Cardiac Surgery, 2019.

Learning points:

- · Preoperative planning for CABG should consider the impact of AV fistulas on LIMA graft flow.
- · Multidisciplinary collaboration is essential to mitigate risks in ESRD patients dependent on dialysis.
- · Early detection and management of graft insufficiency can improve postoperative outcomes.

Anesthesiology management during off-pump implantation of Left Ventricular Assist Device: case series

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Background: The off-pump approach for HeartMate III (HM3) implantation offers potential advantages, including reduced complication rates, faster recovery times, and decreased exposure to systemic inflammation. However, the absence of cardiopulmonary bypass presents anesthetic challenge due to reduced hemodynamic stability. This case series describes our single-center experience managing three consecutive patients who underwent off-pump HM3 implantation from May 2024 to June 2024.

Our goal was to determine if this method was safe and feasible for patients with unique comorbidities requiring tailored perioperative strategies.

Case Report: Patient 1 had biventricular heart failure with coagulopathy secondary to cirrhosis, necessitating meticulous management of bleeding risk and coagulation. Patient 2 presented with a recent acute ischemic stroke, requiring careful hemodynamic control to minimize cerebral complications. Patient 3 had heparininduced thrombocytopenia and pulmonary embolism, posing significant challenges to maintaining adequate hemostasis without the use of a bypass machine.

Discussion: All patients demonstrated favorable outcomes. The median time to extubation was 10.8 hours, with a median intensive care unit (ICU) length of stay of 4.9 days. Hemodynamic improvements were observed, with a mean cardiac index increase from 1.6 L/min/m² pre-implantation to 2.0 L/min/m² postoperatively and a reduction in mean pulmonary artery pressure from 28 mmHg to 15 mmHg. No patients required mechanical support for the right ventricle.

Only the patient with thrombocytopenia required postoperative transfusion, receiving 3 units of platelets.

Notably, these transfusion volumes were significantly lower than those typically required for on-pump HM3 implantations at our center.

Learning points: In this single-center study, we describe the anesthetic considerations for off-pump HM3 implantation. Our results suggest that this approach is a safe and feasible alternative to traditional techniques, offering a potential benefit for high-risk patients with complex comorbidities.

«This research is funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (Grant No. AP19677596)»

32AP10-4

Case report: anesthetic management of retroperitoneal fibroma excision in a patient with complex congenital cardiomyopathy

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Background: Complex cardiomyopathies, present unique perioperative challenges. Even after corrective surgery, meticulous anesthetic and cardiovascular management is required.1 This report illustrates the anesthetic approach of a retroperitoneal fibroma excision in a patient with neurofibromatosis type II (NFII) and surgically corrected complex cardiomyopathy with tricuspid valve atresia, CIV, transposition of the great vessels and coartation of the aorta.

Case Report: A 22-year-old female with a history of Fontan procedure, and NFII, was proposed for laparotomic excision of a retroperitoneal fibroma. The patient's non-pulsatile pulmonary circulation and highly variable O2 saturation levels, ranging between 80-100%, made avoiding increase pulmonary pressure and consequent shunt effect and hypoxemia essential.

TIVA using Etomidate, fentanyl, lidocaine and rocuronium, for induction, followed by maintenance with propofol and remifentanil, was selected. Invasive blood pressure monitoring, and cardiac output was monitored using FloTrac system.

Targets of CO of 7.0L/min were set. Fluid therapy and the effects of mechanical ventilation were monitored and adjusted. A T9-T10 epidural catheter was placed, for postoperative analgesia. No hemodynamic instability, need for aminergic support or significant blood loss was registered.

On leaving the operating room, the patient was alert, extubated, with ventilation patterns and hemodynamic status within normal ranges. With adequate pain control, the patient was transferred to the ICU for monitoring. Postoperative recovery was without complications.

Discussion: This case highlights the anesthetic challenges in managing patients with Fontan physiology. The choice of TIVA minimized myocardial depression, while real-time cardiac output monitoring guided fluid and hemodynamic management. Existing literature supports the importance of tailored anesthetic plans in such high-risk patients.2

References:

1. Folley, Matthew MD*†; Colan, Steven D. MD†; Rhodes, Jonathan MD†; DiNardo, James MD*. Fontan Physiology Revisited. Anesthesia & Analgesia 121(1):p 172-182, July 2015. 2. Adler AC, Nathan AT. Perioperative Considerations for the Fontan Patient Requiring Noncardiac Surgery. Anesthesiol Clin. 2020 Sep;38(3):531-543.

Learning Points: Patients with Fontan physiology require precise anesthetic strategies. TIVA and advanced cardiac output monitoring are effective tools. Multidisciplinary planning is crucial for optimizing outcomes.

Placement of the Tendyne™mitral valve system: description of the first two cases

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Background: The Tendyne™ mitral valve prosthesis is a selfexpandable, retrievable device, offering a potential solution for patients with severe mitral regurgitation (MR) who are not candidates for surgery. This valve supports three porcine pericardial leaflets and is anchored to the cardiac apex with a Teflon epicardial cushion. We report the first two cases of implantation at our hospital.

Case Report: Both patients were over 75 years old, hypertensive, with a glomerular filtration rate of 30 mL/min and ischemic heart disease. The first patient's echocardiogram showed LVEF 40%, dilated left atrium (LA) (57 mL/m2), severe MR with restrictive posterior leaflet, moderate pulmonary hypertension and preserved right ventricle function (RVF). The second patient had LVEF 26%, LA dilatation (80.9 mL/m²), severe MR, moderate tricuspid regurgitation and severely depressed RVF.

Anaesthetic monitoring included BP, CVP, SpO2, ECG, BIS™, cerebral oximetry and pulmonary pressures (Swan-Ganz in the second patient). Fentanyl, midazolam, etomidate and atracurium were used for anesthetic induction. Transesophageal echocardiography (TEE)-guided access using the finger test. Both cases required a left mini-thoracotomy with the collaboration of cardiac surgeons and interventional cardiologists. A Tendyne 33S LP prosthesis was implanted in the first patient and a 33M LP in the second, with positioning confirmed by 3D TEE.

Postoperatively, the first patient required levosimendan for heart failure and had a mean mitral gradient of 4.5 mmHg with moderate LVOT obstruction. The patient was discharged after two weeks. The second patient required reintervention due to bleeding, developed severe tricuspid regurgitation and cardiogenic shock, leading to death.

Discussion: The Tendyne[™] valve is indicated for patients with severe MR, life expectancy <5 years, LVEF ≥30%, LVEDD ≤7.0 cm and unsuitability for surgical repair (1).

While the device has a 97% success rate, postoperative complications, including morbidity and mortality, remain significant. Depressed RVF seems to be partially responsible for the poor postoperative outcome in the second patient.

Reference:

1. Cobiella. Rev Esp Cardiol 2021;74:881.2.

Learning Points: Multidisciplinary selection is crucial for high-risk patients who are not candidates for other interventions. Echocardiography plays a key role in assessing MR severity and mechanisms, pulmonary artery pressures and RVF, which are important prognostic factors.

32AP10-6

Anesthesia management in abdominal aortic aneurysm surgery in a 28-week pregnant patient: a case report

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Background: Aortic aneurysm during pregnancy is a rare but highly fatal condition. Hemodynamic changes pose risks to both the mother and fetus. However, pregnancy limits the use of ionizing radiation traditionally employed during imaging in stent repair procedures.

Case Report: A 39-year-old woman at 26+4 weeks of pregnancy with a history of thyroid disease and two previous cesarean sections was diagnosed with an abdominal aortic aneurysm (AAA) during routine obstetric examination. Urgent abdominal ultrasound revealed an aortic diameter of 76 mm in a 13 cm-long segment. EF 55%, mild mitral and tricuspid regurgitation, PAP: 23 mmHg.

Simultaneous cesarean section and AAA surgery were planned for 28 weeks of gestation. General anesthesia was induced with propofol and rocuronium and maintained with sevoflurane. The obstetric team first performed the cesarean section first, delivering a live infant weighing 900 g with an APGAR score of 2 at 1 minute.

Following delivery, fentanyl and lidocaine were administered, and a remifentanil infusion was initiated. Due to uterine atony unresponsive to all medical and surgical interventions a supracervical hysterectomy and bilateral salpingectomy were performed.

Cardiovascular surgery addressed the aneurysmal aorta(13×7.5×7) with an iliac bifurcated graft. Tranexamic acid (10 mg/kg) was given during graft anastomosis, followed by a continuous infusion (1 mg/kg/h).

Blood loss was managed with a cell saver device, totaling 1300 mL, necessitating transfusion of one unit of erythrocyte suspension and one unit of fresh frozen plasma. Hypotension was treated with a norepinephrine infusion at 0.4 mcg/kg/min. The clamp time was 50 minutes, with stable arterial blood gas values.

The patient was discharged 20 days later with recommendations for cardiovascular surgery follow-up.

Discussion: Pregnancy-associated AAA is rare but carries a high risk of rupture, making early detection critical. This patient lacked common risk factors for aortic dissection, such as Marfan syndrome, Ehlers-Danlos syndrome, bicuspid aortic valve, or Loeys-Dietz syndrome.

Patients with an aortic root diameter of <4 cm may be considered for vaginal delivery, whereas cesarean delivery is recommended for those with a diameter >4 cm due to the risk of aneurysm progression and dissection.

Learning points: Early recognition and multidisciplinary planning are essential in managing AAA during pregnancy. Intraoperative anesthetic management and blood loss control, including the use of cell saver devices and vasopressors, are critical for maternal and fetal outcomes.

Anesthetic considerations in Libman-Sacks endocarditis with severe valve involvement and superinfection in a patient with systemic Lupus **Erythematosus: A Case Report**

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Background: Libman-Sacks endocarditis (LSE) is a thrombotic endocarditis with sterile vegetations, typically affecting mitral (66%) and aortic valve (25%). It occurs in 10% of patients with systemic lupus erythematosus (SLE), often presenting with mild valve regurgitation and 4-6% require surgical intervention [1].

Case Report: A 34-year-old male presented with fever, jaundice. aortic murmur and a LVEF of 46% by TEE (bicuspid aortic valve with severe insufficiency), along with a filiform vegetation on the ventricular cusp (21x6 mm), without abscess. Blood cultures were negative and complement levels decreased, but Coxiella burnetii antibodies, rheumatoid factor and ANCAs were positive. He also had membranoproliferative nephropathy class IV.

The patient was diagnosed with LSE and bacterial superinfection, undergoing aortic valve replacement, left ventricular outflow tract enlargement and endocardial resection.

Anesthetic induction was uncomplicated, with 400 IU/kg of sodium heparin (UFH), an ACT of 426 and 1000 cc of Custodiol for extracorporeal circulation (ECC). The patient was weaned from CPB without complications. Postoperatively, he required norepinephrine, milrinone, 2 units of RBC and protamine (28,000 IU). A normal TEG was recorded. He was extubated on postoperative day 1, received hydroxychloroquine and methylprednisolone, being discharged on day 7.

Discussion: LSE is commonly associated with malignancies, SLE, and antiphospholipid syndrome. It is rare for SLE patients to present initially with LSE [3]. Superinfection is excluded, as its treatment could worsen disease progression and increase morbidity

Treatment includes anticoagulation, corticosteroids and surgery, particularly in cases with severe valvular dysfunction, large vegetations and recurrent embolization [3].

In patients requiring ECC, UFH dosage should be adjusted based on ACT, or if contraindicated, bivalirudin or argatroban may be

However, in APS patients with hypofibrinogenemia, ACT may be prolonged, leading to false positives, thus real-time viscoelastic testing is necessary for accurate monitoring [3]

References:

- 1. Medicine.2023Feb;102(7):e32979
- 2. ReumatolClin.2018Sep-oct;14(5):269-277
- 3. RheumatolInt.2022Dec;42(12):2097-2107

Learning Points: There is no consensus on intraoperative management of superinfected LSE in cardiac surgery. For anesthesiologists, monitoring anticoagulation and administering blood products is challenging due to the risk of thrombosis and bleeding.

32AP10-9

Anesthesia management and continuous positive airway pressure (CPAP) settings in thoracoscopic surgery with ventilated lung total collapse

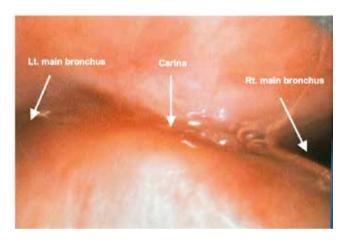
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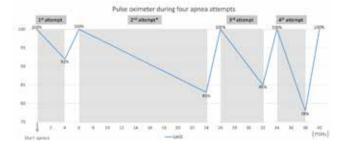
Background: Managing total collapse of the ventilated lung during video-assisted thoracoscopic surgery (VATS) poses significant challenges. This report highlights continuous positive airway pressure (CPAP) and intermittent apnea ventilation strategies to address these challenges and examines their impact on apnea duration.

Case Report: This is a 66-year-old female with non-small cell lung cancer of the right middle lobe (RML), undergoing VATS RML wedge resection.

A double-lumen endotracheal tube (DLT) was initially placed, but a fiberscope examination revealed total occlusion of the left main bronchus.



The DLT was replaced with a single-lumen endotracheal tube. During surgery, intermittent apnea ventilation was applied. Four apnea attempts were made, with FiO2 set to 100% and gas flow at 1.5 L/min. Apnea durations were 4, 17, 6, 5 minutes respectively. Continuous CPAP (APL valve 30 cmH2O) during the second apnea attempt significantly prolonged the apnea duration. Postoperatively, the patient was extubated and transitioned to a highflow nasal cannula.



Discussion: Potential options in this situation include extracorporeal membrane oxygenation support, intermittent apnea ventilation, and selective lobar bronchial blockade. Using bronchoscopic laser to open the collapsed bronchus is also viable(1). However, this method was unavailable due to a lack of equipment. Anesthesia management requires a balance between ventilation support and surgical needs, with continuous monitoring of arterial blood gases.

Reference:

 Ursula Galway. Anesthetic considerations for bronchoscopic procedures: a narrative review based on the Cleveland Clinic experience. J Thorac Dis. 2019 Jul; 11(7): 3156–3170.

Learning Points: This case present the efficacy of CPAP in extending the duration of apnea during VATS with total lung collapse, and provide a reference for similar clinical settings.

32AP10-10

The new role of the anesthesiologist in thoracic surgery: key to achieve better outcomes

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Background: In thoracic surgery, bronchial closure and anastomosis are tecnically simple; however, they concentrate most of the complications (fistula, stenosis, dehiscence) with high morbidity. The use of fibrobronchoscopy by anesthesiologists is frequent to check the correct placement of the double-lumen tube. Since the skill in handling it's increasing, it could be considered a useful tool to reduce complications.

Case Report: A 56-year-old woman with a diagnosis of endobronchial carcinoid tumor. In addition, Von Willebrand's disease, right bullectomy for recurrent pneumothorax in 2008 and pneumonia with hospital admission in 2024. Left upper lobectomy with bronchoplasty by thoracotomy under general anesthesia was performed without incident.

Prior to surgery, fibrobronchoscopy was performed to confirm the position and size of the lesion (Fig1). Subsequently, serial fibrobronchoscopies were performed for endoluminal control of the stump and to rule out complications in the surgical site (Figure).



Figure.

Discussion: This is a patient with a higher risk of bleeding and with a history of severe pneumonia, so the use of a tool such as bronchoscopy could be interesting to reduce the risks associated with surgery. Anesthesiologists are becoming increasingly skilled in the use of the fibrobronchoscope, and we consider that routine endoluminal control of the stump intraoperatively would help to evaluate possible narrowing of the bronchus and rule out active bleeding. In addition, bronchoalveolar lavage could protect the lung against infection and prevent postoperative complications.

Reference:

Geyik FD, Dogruyol T, Kahraman S, Arslan G, Saracoglu KT, Demirhan R. Short-Term Outcomes of Fiberoptic Bronchoscopyguided Resection and Anastomosis Control in Thoracic Surgery. Surgical Laparoscopy, Endoscopy & Percutaneous Techniques. diciembre de 2022;32(6):673-6.

Learning Points: Although further studies are needed, controlling the surgical bed with the fibrobronchoscope potentially reduces complications. Increasing the training of anesthesiologists with the fibrobronchoscope will improve outcomes in the future.

32AP10-11

A risk prediction score for acute kidney injury following thoracic surgery

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Background and Goal of Study: Acute kidney injury (AKI) is considered one of the most common complications following thoracic surgery. AKI is frequently associated with significant morbidity and mortality. The purpose of this study was to develop an AKI prediction score for patients undergoing thoracic surgery.

Materials and Methods: A retrospective cohort study was conducted. All consecutive patients undergoing noncardiac thoracic surgery at a tertiary university hospital between 2012 and 2022 were enrolled. The outcome of interest was AKI within 7 days after surgery. AKI was diagnosed based on serum creatinine criteria from the Kidney Disease Improving Global Outcomes (KDIGO). The univariable and multivariable logistic regression were analyzed and presented with odds ratio and 95% confidence interval (CI). Diagnostic function of the model was determined by area under the receiver operating curve (AuROC). Risk scores were categorized into three groups; low, moderate and high risk. Risk of AKI were presented as likelihood ratios of positive (LH+).

Results and Discussion: A total of 1568 patients were included over 12-year period, and 15.8% (241 of 1568 patients) developed AKI. The significant predictors for AKI were American Society of Anesthesiologist physical status 2 and 3, higher body mass index (> 25 kg/m²), low serum albumin (<3.5 mg/dL) reduced baseline estimated glomerular filtration rate (eGFR) < 60 mL/min/1.73 m², and low intraoperative urine output (<0.5 ml/kg/h). The summation of the score was 9.5 and had a discriminative ability for predicting AKI at AuROC = 0.67 (95% CI : 0.63–0.71). The model was well calibrated with a Hosmer-Lemeshow goodness-of-fit of 4.23 (p = 0.517). LH+ for AKI were: low risk = 0.77 (0.70-0.85) and high risk = 7.37 (0.70-0.85).

Conclusion(s): This study developed an AKI prediction score for thoracic surgery. This score can be used to identify high risk patients, adjust modifiable risk factors and apply preventive strategy in order to improve postoperative outcomes.

Reference:

Shao-HL, et al. Acute kidney injury after general thoracic surgery: A systematic review and meta-analysis. J Surg Res. 2023 I:287:72-81

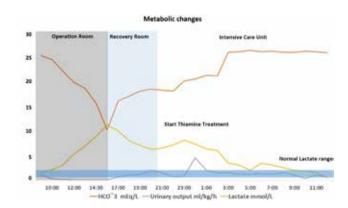
Acknowledgements: This study was funded by a grant from the Medical Council of Thailand.

Severe intra- and post-operative lactic acidosis in robotic thoracoscopic surgery

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Background: Lactic acid accumulation in the blood can cause a high anion gap metabolic acidosis and precipitate negative hemodynamic and metabolic consequences. It happens when lactic acid production exceeds its clearance. It can also result from many conditions, such as impaired tissue oxygenation, decreased oxygen delivery, or a leak in mitochondrial oxygen utilization. There are rare cases of severe lactate elevation in the intraoperative period. Here, we will describe a rare case report during thoracoscopic surgery.

Case Report: A 72-year-old patient with a history of IHD, DM, and HTN was admitted for thoracoscopic robotic left upper lobe lobectomy due to SCC; he completed three courses of chemotherapy and immunotherapy with an excellent response. After two hours of surgery, the blood level of lactate unexpectedly rose to 2.5 mmol/L, progressively elevated, and peaked at the end of the surgery (overall, 8.5 hours), the lactate level reached 10.2 mmol/L with the development of severe lactic metabolic acidosis. Because of life-threatening conditions, fluid boluses were administered, with no improvement in lactate levels and elevation in urinary output. The patient was transferred to the ICU, where thiamine treatment was started.



Discussion: The pathogenesis of this state in our case is not fully clear, it could be induced by chemotherapy, during tumor manipulation by a surgeon "Warburg effect". The successful recovery of blood lactic levels after thiamine treatment might point towards thiamine deficiency as a possible cause of lactic acidosis.

Learning points: We propose that determining the thiamine blood level would exclude a probable thiamine deficiency from differential diagnoses in case of severe lactic acidosis before or during major thoracic surgeries. "Warburg effect" is a rare phenomenon of Lactic acid production by neoplastic cells, the effect of thiamine in lactic acid metabolism is well known, but the role of thiamine treatment is still debatable.

Thoracic Anaesthesia

33AP01-1

Challenge for the anaesthesiologist: management of tracheal perforation

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Background: Tracheal perforation is a rare but potentially lifethreatening complication that can occur following a variety of surgeries. Anesthetic management requires immediate control of the airway, minimising tracheal trauma and ensuring adequate ventilation.

Case Report: A 30-year-old woman, ASA I, with history of a laparoscopic cholecystectomy surgery two days earlier, presented with extensive subcutaneous emphysema and moderate dyspnea. A fibreoptic bronchoscopy (FOB) in ICU under sedation with dexmedetomidine revealed a 3 cm tracheal rupture near the carina.

The patient was taken to the operating room for repair through right thoracotomy. Rapid sequence induction and intubation was performed under direct laryngoscopy with flexometallic endotracheal tube No. 7, with selective FOB-guided intubation of the left main bronchus. The patient tolerated one-lung ventilation, without requiring ECMO support. After the procedure, she was transferred to the ICU for a controlled extubation in the following

Discussion: The management of tracheal injuries represents a significant anesthetic challenge. It is generally preferable to perform guided intubation with FOB to minimize additional airway trauma2.

In terms of ventilation, the objective is to achieve an appropriate balance between adequate oxygenation and protective ventilation. It is important to avoid increasing pressure, as this may aggravate the injury1,2.

It is recommended that volatile anaesthetics be avoided during maintenance to reduce inflammation, improve healing and prevent worsening of subcutaneous emphysema2.

Extubation is a critical point, a early extubation may increase the risk of dehiscence and prolonged ventilation increases the risk of barotrauma and infection.

References:

1. Schleicher A, Groeben H. Anesthetic Considerations for Tracheobronchial Surgery. Journal of Thoracic Disease. 2020;12(10):6138-6142.

2. Hatipoglu Z, Turktan M, Avci A. The Anesthesia of Trachea and Bronchus Surgery. Journal of Thoracic Disease. 2016;8(11):3442-3451.

Learning Points:

- · A multidisciplinary approach is essential to prevent life-threatening complications.
- · FOB-guided intubation is recommended to minimize tracheal
- · Anesthetic management and protective ventilation attempt to prevent worsening of the tracheal injury.
- · Postoperative care should maintain airway integrity and assess the risk/benefit of early extubation.

33AP01-2

Comparison of erector spina plan block and retrolaminar block for video-assisted thoracopic post-surgery analgesia

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Background and Goal of Study: In our study, it is aimed to compare the analgesia efficacy of these two blockades by performing ultrasound-guided erector spina block and retrolaminar block in patients undergoing video-assisted thoracoscopic surgery.

Materials and Methods: This study was started after obtaining ethics committee approval from Health Sciences University Gülhane Training and Research Hospital Clinical Research Ethics Committee. Fifty-four patients, ASA I-II, aged between 18-81 years, who would undergo video-assisted thoracoscopic surgery, were included in the study.

The patients were randomized by computer program and divided into 2 groups as Group ESP (n=27) and Group Retrolaminar (n=27). Retrolaminar and ESP blocks were applied to all patients under ultrasound guidance after general anesthesia and preoperatively.

The block fluids of the patients in both groups were adjusted to be 40 ml in total, as 30 ml of 0.5% bupivacaine and 10 ml of 2% lidocaine.1 gr Paracetamol iv was administered to all patients 30 minutes before the end of the surgery.

Postoperative side effects of the patients in the recovery room, the first postoperative analgesic requirement, VAS scores at 1, 6, 12 and 24 hours, total amount of tramadol and diclofenac consumed in 24 hours were recorded.IBM SPSS version 20 (Chicago, IL, USA) program was used for statistics and p<0.05 was accepted as statistical significance limit.

Results and Discussion: When the VAS scores at 1, 6,12 and 24 hours were compared between the retrolaminar group and the ESP group, no significant difference was found (p>0.05). Intraoperative remifentanil consumption was found to be significantly higher in the retrolaminar group compared to the ESP group (p<0.05). No significant difference was found between the groups in terms of nausea, vomiting and other side effects(p>0.05).

	Retrolaminar	ESP		
	Avarage ± SD Median (Min-Max)	Avarage ± SD Median (Min-Max)	Test Statistic	р
VAS 1.hour	4.11±1.98 3 (2-8)	5.33±2.40 6 (1-9)	261.0 °	0.069
VAS 6.hour	3.22±1.18 3 (2-7)	3.15±1.16 3 (0-7)	360.5 °	0.941
VAS 12.hour	2.22±1.28 2 (1-6)	2.70±1.54 2 (0-6)	291.5 °	0.192
VAS 24.hour	1.15±0.94 1 (0-3)	1.52±1.05 1 (0-3)	296.0 °	0.217
Test Statistic d	50.723	44.047		
p	<0.001	<0.001		
Post hoc	1.hr-6.hr p=1.000	1.hr-6.hr p=0.122		
	1.hr-12.hr p=0.007	1.hr-12.hr p=0.004		
	1.hr-24.hr p<0.001	1.hr-24.hr p<0.001		
	6.hr-12.hr p=0.092	6.hr-12.hr p=1.000		
	6.hr-24.hr p<0.001	6.hr-24.hr p=0.001		
c:Mann Whitney U test d:Friedman test	12.hr-24.hr p=0.019	12.hr-24.hr p=0.050		

Conclusion(s): In our study, no difference was found between the two groups in terms of postoperative analgesia consumption and VAS scores. Both blocks can be used as part of multimodal analgesia, but they are not effective alone to provide postoperative analgesia.

33AP01-3

Fluid therapy with gelatines and Cardiac **Surgery-Associated Acute Kidney Injury:** a retrospective observational cohort study

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Background and Goal of Study: Cardiac Surgery-Associated Acute Kidney Injury (CS-AKI) is among the most common causes of AKI in intensive care units. This study assesses the association between the administration of fluid therapy with gelatines and CS-AKI.

Materials and Methods: Patients who underwent cardiac surgery at the Clinica Universidad Navarra from the 1st of September 2022 to the 31st of August 2023 were consecutively collected. Data used in this study was extracted from either the surgical chart, blood analysis or previous medical cardiac reports. The primary outcome was acute kidney injury (AKI), defined by KDIGO. Pearson Chi-squared test, unadjusted Odds Ratio, and multivariable logistic regression model were developed sequentially in the statistical analysis.

Results and Discussion: 66 patients were included. The overall AKI rate was 33%. No difference in AKI was observed between groups (30.9% vs 37.5%). No difference in AKI rate was observed in the logistic regression analysis adjusting by age, sex, eGFR and EuroSCORE II (adjusted OR 1,66, 95% CI 0,47-5,85, p= 0,428). Patients developing CS-AKI had a higher rate of in-hospital mortality (0% vs 13.6%).

Conclusion(s): In our retrospective observational cohort study, fluid therapy with gelatins was associated with a tendency, not statistically significant, toward an increase in CS-AKI.

References:

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- 2. Moeller C, Fleischmann C, Thomas-Rueddel D, Vlasakov V, Rochwerg B, Theurer P, et al. How safe is gelatin? A systematic review and meta-analysis of gelatin-containing plasma expanders vs crystalloids and albumin. J Crit Care. 2016 Oct 1;35:75-83.

33AP01-4

Anesthetic management of a patient with Morvan syndrome: A case report

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Background: Morvan syndrome (MvS) is an extremely rare autoimmune condition characterized by peripheral nerve hyperexcitability, dysautonomia and encephalopathy, with symptoms such as myokymia, autonomic instability and cognitive dysfunction. It is often associated with autoantibodies targeting voltage-gated potassium channels and frequently linked to thymoma. Anesthetic management is particularly challenging due to profound autonomic dysfunction and so the risk of perioperative complications. including cardiac arrest. Robotic thymectomy first described in 2021, may offer symptom resolution through autoantibody suppression.

Case Report:65 year-old-male with MvS scheduled for elective robotic thymectomy for a thymoma. Prior to surgery,he showed cognitive decline, hallucinations and dysautonomia. Initial treatment with immunoglobulins and steroids resulted in partial improvement, though cognitive symptoms worsened upon discontinuation.

Further investigation confirmed positive Caspr2 antibodies and axonal hyperexcitability. On the day of surgery, the patient showed severe cognitive impairment and respiratory distress.

Anesthesia management included a left-sided double-lumen endobronchial tube for one lung ventilation, a radial arterial line,Bispectral Index,regional oximetry and neuromuscular monitoring.Rocuronium was administered at standard doses. A right serratus intercostal interfascial plane block was performed.

During surgery, the patient showed cardiovascular instability, necessitating a norepinephrine infusion. Following thymectomy, the patient was successfully extubated in the operating room and was discharged to the ward after 24h at the PACU. His neurological condition improved significantly during the next days.

Discussion: MvS anesthesic approach can be challenging due to variable responses to neuromuscular blocking agents and risks of laryngospasm and cardiovascular instability.

Neurological monitoring is crucial due to potential myokymia and encephalopathy, which can affect BIS readings. In our case, no resistance to rocuronium was observed. Monitoring BIS and IN-VOS during surgery helped ensure proper oxygenation and neurophysiological stability.

Learning points: A comprehensive anesthetic approach is crucial and requires careful consideration of neuromuscular blockade. The use of short-acting sympathomimetics and opioids is advised for cardiovascular instability. Neurological monitoring should be interpreted with the understanding that myokymia can affect readings.

33AP01-5

Respiratory stability and sedation efficiency of remimazolam in non-intubated video-assisted thoracic surgery: Insights from a retrospective cohort study

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Background and Goal of Study: Single-incision video-assisted thoracoscopic surgery (VATS) is recognized for its safety, efficiency, and minimally invasive nature, offering fewer complications and shorter hospital stays. When combined with non-intubated spontaneous breathing, it further enhances recovery by reducing complications, operating time, and anesthesia duration. Remimazolam, an ultrashort-acting benzodiazepine, features a rapid onset and offset with minimal respiratory depression, making it a promising agent for non-intubated VATS (NIVATS).

Materials and Methods: This retrospective study conducted at Taipei Veterans General Hospital, Taiwan, included 62 patients undergoing single-port NIVATS. Between August 2019 and December 2021, 41 patients received propofol with dexmedetomidine, while 21 patients between January 2023 and December 2023 received remimazolam with dexmedetomidine. The primary outcome was the change in arterial carbon dioxide pressure (ΔPaCO2).

Secondary outcomes included anesthesia duration, surgery duration, and postoperative hospital stay. Propensity score matching was used to control for confounders. Subgroup analyses compared thoracic epidural anesthesia (TEA) with paravertebral block (PVB).

Results and Discussion: The remimazolam group exhibited a significantly smaller increase in PaCO2 (6.84 ± 6.01 mmHg vs. 14.42 \pm 11.55 mmHg; p = 0.0113) and shorter surgery duration (50.19 \pm 26.12 minutes vs. 83.54 ± 24.86 minutes; p < 0.0001) compared to the propofol group.

There were no significant differences in anesthesia duration or postoperative hospital stay. Subgroup analysis revealed consistent outcomes between TEA and PVB groups, supporting the flexibility of remimazolam-based sedation. Importantly, no patients required flumazenil reversal.

Conclusion(s): This study highlights the efficacy and superior respiratory stability of the remimazolam-dexmedetomidine combination in NIVATS.

These findings suggest remimazolam as a viable alternative to traditional agents in this setting. Further research is warranted to validate these results across broader surgical contexts.

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- 1. Wen Y, Liang H, Qiu G, Liu Z, Liu J, Ying W, et al. Non-intubated spontaneous ventilation in videoassisted thoracoscopic surgery: a meta-analysis. Eur J Cardiothorac Surg. 2020; Mar 1;57(3):428-
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33AP01-6

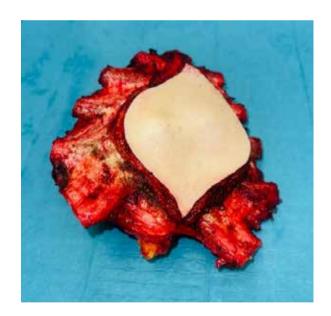
Anaesthesia challenges for resection of monster sternal chondrosarcoma and reconstruction of rib cage with 3D implant and local flap. A case report

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Background: Massive sternal chondrosarcomas are rare malignant tumours arising from the cartilage of the sternum, presenting significant challenges for anaesthesia and surgery. An extensive surgery was performed in this case, involving cardiothoracic, orthopaedic and plastic surgeons.

Case Report: A 71-year-old male presented with a 8 cm sternal mass causing compression on the right heart. Surgical planning necessitated a multidisciplinary approach and operation involved bone marrow harvesting, bilateral VATS resection of sternal mass with bilateral rib resection, reconstruction of the pleural and chest wall defect using Gore-Tex membrane, 3D-printed osteopore implant, and local advancement flap closure.

Invasive arterial line and central venous access was established preoperatively before cardiostable anaesthesia induction. The airway was secured with double lumen endotracheal tube to facilitate one lung ventilation for alternating lungs. Surgery was completed successfully and postoperative period was uneventful.





Discussion: Intraoperative challenges:

- 1. One lung ventilation and ventilation strategies to prevent hypoxia during 12 hour long procedure.
- 2. Various surgical positions involving traction table for femoral bone marrow aspiration and then supine with various table tilts to facilitate VATS and reconstructive surgery.
- 3. Blood, colloid and crystalloid transfusions.
- 4. Analgesia, normothermia and postoperative intensive care. References:

Liu, D. et al (2021). Resection of a giant sternal chondrosarcoma and chest wall reconstruction: a case report. Annals of Translational Medicine, 9(22), 1706-1706.

Learning Points: Anaesthesia plays a critical role in the coordination of multiple disciplines and in providing an appropriate surgical conditions for successful outcome.

33AP01-7 **ESPB in VATS: will it make a difference?**

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Background and Goal of Study: Video-assisted thoracoscopic surgery (VATS) has become the most widely used surgical technique for lung resection. Adequate multimodal analgesia is essential for patient comfort and preservation of lung function. Erector spinae plane nerve block (ESPB) stands out for its safety and simplicity of execution.

The aim of this study was to evaluate the impact of an ultrasoundguided ESPB on the quality of recovery (QoR) after VATS.

Materials and Methods: After study approval by the institutional ethics committee, a prospective study was conduct to evaluate the QoR after VATS. Exclusion criteria were inability to give consent, age under 18 and ICU admission.

For this study, patients were divided into two groups:

Group 1 received an ultrasound-guided ESPB performed by an anesthesiologist in addition to the standard protocol:

Group 2 followed the standard protocol, which consists of balanced general anesthesia and an intercostal nerve block.

Data collection was carried out from March to August 2024 through the application of the Portuguese version of the "Quality of Recovery 15" questionnaire (QoR15) at 24h after surgery. The QoR15 severity was classified as poor, moderate, good and excellent.1

Continuous variables were compared using the t-test for parametric data and the Mann-Whitney U test for non-parametric data. Categorical variables were analyzed using the chi-square test or Fisher's exact test. IBM® SPSS® v28 was used to perform statistics, with a significance level defined as p < 0.05.

Results and Discussion: Thirty-five patients undergoing VATS were included (60% men; median age of 64.5 years), 74% classified as ASA III. ESPB was performed on twenty-six patients (Group 1). The studied cohort had a mean QoR-15 score of 111.1 ± 30.1, with similar results in both groups. In terms of severity, 60% of the cohort had a moderate QoR-15 score, while 20% achieved excellent or good classifications, and 20% were classified as poor. Group 2 showed a higher percentage of patients with poor scores (33.3%) compared to Group 1 (15.4%), though this was not statistically significant.

Conclusion(s): In this small sample size study, despite the absence of a statistically significant difference, patients undergoing ESPB had a lower percentage of poor QoR-15.

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33AP01-8

Estimation of right main stem bronchus length: a crucial criterion for choice of appropriate equipment for lung isolation

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Background and Goal of Study: Double lumen Tube-DLT or bronchial blockers-BB are widely used for one lung ventilation-OLV. Anatomical variations of the length of the right main stem bronchus- RMB may lead to difficulties in the position of right sided double lumen tube-RDLT or BB. There are some specific clinical situations where the placement of RDLT is mandatory. Normally the length of the RMB is between 1,5-2,5cm. The RDLT has a weirdly shaped eccentric cuff, to prevent the occlusion of the right upper lobe bronchus.

The distance between the tip of the tracheal edge and the Murphy's eye is 2,5cm, even in the 35F DLT. If the length of the patient's RMB is short, then the risk of malposition is high. It is suggested that when the distance between the tracheal carina and the distal margin of the right upper lobe orifice is <23mm, a left sided DLT is more appropriate.

The aim of this study is to measure intraoperatively under fiberoptic bronchoscopy-FOB the distance between the tracheal carina and the middle of the orifice of the right upper lobe -RMBo, in patients undergoing elective thoracic surgery for lobectomy or heart valve replacement and to discuss the application of alternative methods for lung separation for OLV.

Materials and Methods: 20 patients (6 women-14 men) (32-84years old) with a mean height 1,69m (1,84-1,57m) undergoing thoracoscopic lobectomy or thoracoscopic transaxillary valve replacement were included in this study.

The patients were intubated with single lumen tube and before advanced the bronchial blocker for lung isolation we perform the measurements with a 3,8 mm external diameter FOB, in supine

The distance between the tracheal carina and the center of the orifice of the right upper lobe was measured. The measurements were performed twice by two different anaesthesiologists.

Results and Discussion: The RMBo was: 1,15cm (0,5-2,5cm) and it was not correlated with patient's height. Indeed, 4 patients had RMBo <0.8cm and only 2 patients had RMBo>2,2cm. If we consider that the distance between the tip of the tracheal edge and the Murphy's eye is 2,5cm, in only 2 of 20 patients we could introduce safely a RDLT, without the risk of herniation and inadequate ventilation.

Conclusion(s):: It is a pilot study, which however reveals the wide anatomical variation of the length of RMB, the increased percentage of malposition and occlusion of trachea with RDLT. Moreover. the length of the bronchial balloon in a bronchial blocker is 3cm. That means that we should also be careful in a patient with short RMB in order for the trachea not to be occluded, especially during surgical manipulations.

In our patients we have chosen to isolate the lung with Ez Blocker (Rush- Teleflex) because the Y shape makes it difficult to be misplaced and occlude the trachea.

References:

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33AP01-9

Impact of intraoperative platelet transfusion on the risk of primary graft dysfunction after lung transplantation: a single-centre retrospective study

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Background and Goal of Study: Primary Graft Dysfunction (PGD) is a major cause of short- and long-term morbidity and mortality after lung transplantation (LT). Several donor, recipient and technical risk factors have been identified, including blood products transfusion, although evidence remains inconsistent.

We aimed to investigate the association between intraoperative platelet transfusion during LT and the incidence and severity of PGD as primary outcome, and 30-day mortality as secondary

Materials and Methods: This single-centre retrospective study included all adult patients who underwent single or two LT at CHU UCL Namur Hospital, Belgium, between January 2010 and March 2020, after approval from the ethics committee. The definition and grading of PGD were based on the 2016 ISHLT consensus. All chest radiographs performed during the first 72 hours after surgery were reviewed by three authors (XDM, FC, TPB). To determine whether platelet transfusion was an independent risk factor for PGD, multivariable logistic regression analysis was performed.

Results and Discussion: A total of 257 patients underwent LT during the study period. Among them, 51% presented at least one chest X-ray with bilateral diffuse infiltrates over the first 72 hours, compatible with the definition of PGD. Univariate analysis identified an association between PGD and platelet transfusion (p=0.005), preoperative mean pulmonary artery pressure (p=0.02) and intra-operative ECMO (p=0.004). The association between platelet transfusion and PGD remained significant in the multivariable analysis (p=0.02; OR=2.03, 95%CI 1.09-3.78), Platelet transfusion was also associated with PGD severity (p=0.003). Twelve patients died within the first 30 post-operative days with a statistically significant association with platelet transfusion (p<0.001, OR 2.80, 95%CI 1.72-4.56). The low incidence of death precluded multivariable analysis.

Several pathophysiological mechanisms support the association between platelet transfusion and PGD, including platelet-induced inflammation, endothelial dysfunction, microvascular damage, hypercoagulability and immune activation in the already vulnerable lung transplant.

Conclusion(s): This study identified platelet transfusion as a potential risk factor for PGD. Reducing patient exposure to heterologous platelets therefore seems a logical step to improve patient outcome after LT. The use of autologous platelet recovery systems could contribute to this goal.

33AP01-10

Massive transfusion protocol and Factor XIII administration in massive hemorrhage during immediate postoperative care following bilateral lung transplantation with ECMO support: a case report

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Background: Lung transplantation is a definitive surgical treatment for patients with advanced pulmonary diseases; however, it may present a high rate of postoperative complications, with massive bleeding being one of the most severe events.

This can be related to the anticoagulation required during surgery, disseminated intravascular coagulation, and extracorporeal circulation support.

Case Report: A 67-year-old male with a history of diffuse interstitial lung disease underwent a bilateral lung transplant with venovenous ECMO support in the immediate postoperative period. Upon admission to the critical care unit, the patient was hemodynamically unstable, requiring vasoactive drugs, with an oxygen saturation of 86-87% and massive bleeding through chest drains, associated with intraoperative anticoagulation (aPTT > 400). The massive transfusion protocol was activated and Factor XIII was administered. This resulted in decreased bleeding and a significant hemodynamic improvement, allowing for a reduction in the need for vasoactive drugs.

However, due to persistent bleeding, surgical exploration was performed, identifying active bleeding from the right bronchial artery, which was successfully treated with direct sutures. The patient was extubated, removed from ECMO, and discharged without further hemorrhagic episodes.

Discussion: Managing massive bleeding in lung transplant patients with ECMO support represents a significant challenge due to the impact of anticoagulation and the hemostatic dysfunction in these patients. The use of Factor XIII in this case proved effective in stabilizing hemostasis in the context of refractory bleeding. Although the evidence for the empirical use of factor XIII in these scenarios remains limited, it should be considered in the management of patients with ECMO, particularly when other hemostatic measures fail to control bleeding.

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- 2. Ziegeler, S. Anesthesiological management of major thoracic surgery with intraoperative ECMO support in adults.

Learning points: The use of factor XIII can be beneficial in the management of refractory massive bleeding in patients with ECMO and lung transplantation and early activation of massive transfusion protocols, including blood products, fibrinogen, and tranexamic acid, is crucial for controlling hemorrhage in these patients.

33AP01-11

Effect of intraoperative goal directed fluid therapy on patient outcomes in patients undergoing thoracoscopic lobectomy in the Era of ERAS

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Background and Goal of Study: We aimed to investigate the effect of goal-directed fluid therapy (GDFT) compared to conventional fluid therapy in thoracoscopic lobectomy surgery with ERAS protocol on intraoperative pulmonary oxygenation and 30-day patient outcomes including postoperative morbidity and mortality. The primary outcome measure of the study was the PaO2/FiO2 ratio (change in pulmonary oxygenation) during one-lung ventilation, and the secondary outcomes were postoperative morbidity, quality of recovery, 30-day re-admission, and mortality rate.

Materials and Methods: This randomized controlled study analyzed 80 adult patients who underwent thoracoscopic lobectomy surgery with the ERAS protocol. In addition to standard monitoring in the operating room, all patients underwent Pressure Recording Analytical Method (PRAM) monitoring.

Patients were randomly assigned to GDFT and conventional fluid therapy groups. In the GDFT group, fluid, inotropic agent and/or vasopressor therapy was administered by targeting stroke volume variation (SVV) and cardiac index (CI).

In the control group, fluid and/or vasopressor therapy was administered with the guidance of MAP 65-95 mmHg and urine output at least 0.5 mL/kg/hr. Intraoperative hemodynamic data, amount and types of fluid administered, inotropic and vasopressor agents were recorded. Vital signs, pulmonary, cardiac and other system morbidity, quality of recovery on days 1, 3 and 5, and re-admission to hospital and mortality within 30 days were recorded.

Results and Discussion: The groups were similar in terms of demographic characteristics and preoperative physical findings. Statistically similar results were obtained in the change of PaO2/ FiO2 ratio over time (p=0.282). Both groups were similar in terms of intraoperative hemodynamic data (p>0.05). Statistically similar results were also detected in both groups in terms of patient data on the 1st, 3rd, 5th and 30th days regarding quality of recovery, pulmonary, cardiac and other complications, length of hospital stay and mortality rates (p>0.05).

Conclusion(s): In thoracoscopic lobectomy surgeries with ERAS. intraopertive GDFT does not cause a difference in intraoperative pulmonary oxygenation, postoperative pulmonary, cardiac, renal and infectious complications, quality of recovery, length of hospital stay, 30-day hospital re-admission and mortality rates when compared with conventional fluid therapy.

Lung: Ventilation and Pulmonary Disease in the OR and ICU

33AP02-2

Investigation of the effects of lung protective mechanical ventilation in robotic surgeries performed in trendelenburg position

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Background and Goal of Study: Robotic surgery requires general anesthesia, pneumoperitoneum, and the Trendelenburg position, which can impair hemodynamic and respiratory function. Lung protective ventilation aims to reduce these effects.

In our study, we aimed to retrospectively investigate the effects of recruitment manoeuvres (RM) on blood pressure, heart rate, oxygen saturation, airway pressures, compliance and postoperative respiratory complications in intraoperative mechanical ventilation management in patients undergoing robotic surgery in the Trendelenburg position.

Materials and Methods: This study was approved by the Gazi University Hospital Ethics Committee. Robotic surgery patients operated on between 2012-2022 were retrospectively reviewed, 123 underwent fixed PEEP and 135 underwent recruitment manoeuvres with individualised PEEP. RM was performed with the "stepwise PEEP increase" technique during pressure-controlled ventilation; after intubation (T₁), after insufflation (T₂), after positioning (T₃) and after desufflation and position correction (T₄). Patients were divided into two groups as fixed PEEP (Group 1) and individualised PEEP (Group 2). SPSS 21.0 programme was used for statistical analysis. Hemodynamic and respiratory data and postoperative respiratory complications were evaluated by Mann-Whitney U test, Student's t-test and γ2 test. Complementary statistics were presented as frequency, percentage distribution, mean, and median.

Results and Discussion: In our study Group 1, no significant difference in mean arterial pressure(MAP) was observed. In Group 2, MAP was significantly lower at T3 compared to T1 and T4(P<0.05). In intergroup comparison, EtCO₂ was significantly lower in Group 2 than in Group 1 at T2 and T3.

Group 1 also had significantly higher EtCO2 than Group 2 at T3 and T4(P<0.001). Lung compliance was significantly higher in Group 2 than in Group 1 at all times. Respiratory distress was detected to be significantly higher in Group 1 than in Group

Lung-protective mechanical ventilation can reduce perioperative complications, but there is ongoing debate about the best approach. Individualised PEEP after RM, a lung-protective strategy, is crucial for determining when and how it should be applied during surgery.

Conclusion: Our study found that stepwise RM reduced atelectasis, improved compliance, decreased EtCO, while increasing PaO₂ and SpO₃, lowered postoperative respiratory complications in patients.

33AP02-4

Description of the incidence of atelectasis in robotic surgery under extreme Trendelenburg using Air-Test and lung ultrasound

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Background: The anesthetic-surgical process is associated with changes in respiratory function that can manifest as postoperative pulmonary complications. The most common are atelectasis (AT), that can lead to respiratory failure, ultimately increasing morbidity, mortality and healthcare costs. Certain surgical positions, such as extreme Trendelenburg (T>320), can worsen this phenomenon (1).

Novel methods such as the Air-Test (2) and lung ultrasound (LUS) (3) allow the anesthesiologist to detect AT early and manage them accordingly, either intraoperatively or postoperatively.

Primary objective: To evaluate the overall incidence of AT in patients undergoing urological surgery in the T>32° position.

Secondary objective: To study the performance of the Air-Test to detect postoperative AT diagnosed by LUS.

Materials and Methods: This is a single-center prospective observational study. Inclusion criteria were all patients >18yo undergoing robotic urological surgery in T>32°. Exclusion criteria were baseline oxygen saturation less than 97%, and refusal to participate.

Patient characteristics, as well as length of surgery and ventilatory parameters were recorded. LUS, AirTest and PaFI were performed at different time-points throughout surgery. AT was defined as an increase in LUS score (PACU timepoint - basal timepoint) greater than 2.

Mann-Whitney U test and Fisher's exact test were used for continuous and categorical variables, respectively. Diagnostic performance of Air-Test against LUS was evaluated by calculating sensitivity, specificity, positive predictive value, negative predictive value, and accuracy. Agreement was assessed using McNemar's test. A two-tailed significance level of 0.05 was considered statistically significant.

Results and Discussion: Between June and October 2024, we included 28 patients (92.9% males). Overall incidence of AT was 38.6%. Among factors associated with AT we found higher BMI (28.3 (26.9-30.2) vs 25.3 (24.0-27.5) Kg/m², p= 0.041), higher proportion of ASA III-IV status (5 (45.5%) vs 0 (0%) p= 0,001) and lengthier T>32° (190 (166.5-211.5) vs 116 (110-150) min, p<0.001). Sensitivity and specificity of the Air-Test to detect atelectasis by LUS were 40% and 81.2%, respectively, with a McNemar p value

Conclusion: in our cohort BMI, ASA status and T>320 time were associated with atelectasis. Air-Test performed as a reliable tool to diagnose postoperative atelectasis.

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33AP02-5

Complications associated with high frequency jet ventilation (HFJV) during rigid bronchoscopy, a 5 years retrospective study

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Background: HFJV is the standard ventilation for bronchoscopy. Few studies addressed the complications associated with HFJV. Fernandes et al showed that ASA 4 score and basal SPO₂ < 95 are associated with complications.(1)

In this study, we wanted to analyse the frequency and type of complications associated with HFJV, and determine the factors associated with the occurrence of complications.

Materials and Methods: After IRB approval and ClinicalTrial registration (NCT06285994), we reviewed the charts of 833 patients who underwent a bronchoscopy with HFJV in 2019-2023. For continuous data, the assumptions of the T-test were tested: determine if groups have comparable variances with Bartlett's test for homogeneity of variance and if the residuals of the T-test are normally distributed.

When one of the underlying hypotheses was not met, a nonparametric approach was used with Wilcoxon-signed-rank test. Categorical variables were analysed with Chi-square. Means and standard deviations or medians and interquartile ranges for continuous data are presented, as appropriate, and counts and percentages are presented for counts data. Univariate relationships were tested between groups with or without complications.

Significant variables (Height, basal SpO2, preop Oxygen and ASA class were entered into a multivariate regression and nonsignificant terms were removed one by one (backward selection procedure). R software (R Core Team, 2021), version 4.2.0. was used to produce the results.

	Complication of HFJV: Yes	Complication of HFJV: No
Hypoxemia	89 (10.75)	739 (89.25)
Severe hypoxemia ($SpO_2 \le 85\%$)	32 (3.96)	801 (96.04)
Moderate hypoxemia ($85\% < SpO_2 \le 90\%$)	57 (6.84)	776 (93.16)
Hypotension (Systolic arterial blood pressure < 90/60 mm Hg)	230 (27.74)	599 (72.26)
Cardiac arythmia	4 (0.48)	827 (99.52)
Laryngopasm	5 (0.60)	827 (98.80)
Bronchospasm	10 (1.20)	822 (98.80)
Baro or volotrauma	1 (0.12)	831 (99.88)
ICU admission	3 (0.36)	823 (99.64)

All values are expressed as N (%)

Table 1.

Multivariate logistic regression model									
Variable Estimate Standard error z value Pr(>lz									
Intercept	16.970	3.396	4.998	< 0.001					
Height	-0.024	0.008	-3.044	0.00233					
SpO ₂ (basal)	-0.141	0.032	-4.398	< 0.001					

ROC curve of the logistic regression model: AUC 61.93% (95%CI 57.94%-65.93%)

Results and Discussion: Complications are shown in Table 1. Overall, complications of HFJV were low, most frequent complications were arterial hypotension and hypoxemia. After multivariate regression, only small height and lower basal SpO₂ were associated with complications. The model gives an area under the curve (AUC) of 62%, so its predictive value is not very strong.

Conclusion(s): The frequency of complications with HFJV is low, small height and lower basal SpO, are the sole predictor of complications.

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33AP02-6

Automating surveillance for Ventilator **Associated Pneumonias in critical care**

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Background and Goal of Study: Diagnosing ventilator associated pneumonia (VAP) is challenging due to unclear diagnostic criteria in the literature. Manual VAP surveillance requires significant staff training and time, and in Oxford Critical Care (OCC) this has not been maintained due to resource constraints. In the US. CDC Ventilator Associated Event (VAE) criteria are widely used, with many areas automating the surveillance process.

This project aimed to manually audit VAP rates using CDC criteria to establish a baseline and develop an automated tool for quarterly reporting with minimal staff input.

Materials and Methods: Automated surveillance: An automated surveillance tool (AST) for ventilator associated events was developed using structured query language (SQL) and a clinical reporting system within the electronic patient record system (Phillips ICCA).

This tool retrospectively identified ventilator associated complications (VACs) and infective ventilator associated complications (IVACs) cases, validated against microbiological data. After manual validation, the tool was run for six months (24/01/2024 - 14/07/2024) to report VAC, IVAC and PVAP (possible VAP) fre-

Manual Validation: Over 14 days (05/06/2024 - 18/06/2024), OCC patients intubated for ≥ 48 hours with stable/decreasing FiO2/PEEP were monitored for increasing FiO2/PEEP as per CDC Ventilator-associated Complications (VAC) guidelines. Data for patient demographics, inclusion criteria, and VAC/IVAC/PVAP parameters were recorded in Excel.

Results and Discussion: Manual validation: 15 intubated patients were recorded, with no VAC identified. The AST flagged one pa-

AST: 14 ventilator-associated complications were detected over six months, including 5 IVAC cases. Clinical review confirmed only one true VAP, supported by microbiological and radiological find-

The median day of deterioration was day 2. OCC VAP rate, as per CDC criteria, is low and aligns with published data. Early VACs are common, reflecting our case mix of complex trauma and surgical

Each deterioration had an identifiable cause. The AST accurately identified VAC and IVAC cases and detected a VAP missed by manual audit.

Conclusion(s): Automated surveillance of VAE is a valid option on ICUs with an Electronic Health Record. Further work is planned to optimise the AST and validate it for prospective surveillance. This manual/automated comparison study should be repeated in 3 months.

33AP02-7

A case series of high nasal flow therapy for postoperative respiratory failure

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Background: Respiratory failure is the most common postoperative pulmonary complication, especially in patients undergoing major abdominal surgeries. Oxygen administration is routinely used postoperatively to prevent hypoxemia but cannot prevent hypoventilation and hypercarbia.(1)

High nasal flow cannula (HNFC) could be used postoperatively in high risk patients to prevent pulmonary complications.(2)

Case report: We describe our experience of three patients that were complicated with respiratory failure within the first 48 hours postoperatively and received HNFC therapy to prevent deterioration and intubation.

The respiratory status of the first two patients was aggravated within the first two postoperative days while the 3rd patient was complicated with type 2 respiratory failure just hours after surgery. HNFC was well tolerated by all three patients and was used for no more than 48 hours.

The oxygen administration was gradually de-escalated and all three patients were discharged. Two of them received home oxygen therapy.

Discussion: HNFC generates small amounts of positive endexpiratory pharyngeal pressure, increases inspiratory airflow and decreases dead space ventilation.

Postoperative patients suffer from decreased functional residual capacity (FRC) especially in the first postoperative day, which can lead to atelectasis, fever and pneumonia.(3)

HNFC providing positive end-expiratory pharyngeal pressure could help increase the FRC and reduce the incidence of postoperative respiratory failure if applied promptly.

References:

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Learning points: HNFC may be a promising postoperative ventilation mechanism for high risk patients undergoing major abdominal surgeries, preventing severe pulmonary complications and the need for intubation and mechanical ventilation.

33AP02-8

Correlation of impedance changes in EIT and tidal volumes and their influencing factors

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Background and Goal of Study: Electrical impedance tomography (EIT) is a non-invasive functional imaging technique to monitor regional ventilation, especially distribution and dynamics of ventilation within different regions of the lungs. However, the quantification of clinically used ventilation parameters like tidal volume (VT) - as repeatedly requested by clinicians - has not been possible so far since EIT measures relative and not absolute changes in impedance (1).

Thus, the goal of this study was to evaluate the relationship between impedance changes (dZ) and the magnitude of VT in humans and to identify additional factors influencing this relation-

Materials and Methods: 27 patients scheduled for elective surgery under general anaesthesia and need for endotracheal intubation were equipped with a commercially available EIT belt. Measurements were performed at four VTs (6, 8, 10 and 12 mL/ BW, in randomized order) on each of four PEEP levels (0, 5, 10 and 15 cmH₂O, also in randomized order). Linear regression analysis was performed for normalized dZ and VT per ideal bodyweight (VT IBW) using the respective means.

To evaluate additional influencing factors, multiple regression analysis was performed with normalized dZ as dependent variable and VT_IBW, PEEP, gender, age, height and weight as independent variables.

Results and Discussion: Regression analysis for the individual patients showed good correlations between VT IBW and normalized dZ (mean R² 0.890 ± 0.15). However, for the group of patients, correlations were rather weak (R2 0.485).

Nevertheless, adding the abovementioned factors to multiple regression analysis improved the model (adjusted R² 0.767) with VT IBW having biggest impact (β: 0.998), followed by weight (β: -0.974), height (β: 0.629), and PEEP (β: 0.108); age did not contribute to it significantly. Increases in VT_IBW, PEEP, and height increased, while female gender and higher weight decreased normalized d7.

Conclusion(s): There was a strong linear correlation between normalized dZ and VT_IBW in the individual ventilated human that was not seen when analyzing the cohort. PEEP, gender, weight and height were identified as additional influences that need to be considered when estimating VT by dZ. An individual calibration might improve estimation of VT by dZ.

References:

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33AP02-9

Impact of positive end-expiratory pressure on oxygenation, respiratory compliance, and hemodynamics in obese patients undergoing laparoscopic surgery in reverse Trendelenburg position: A systematic review and meta-analysis of randomized controlled trials

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Background and Goal of Study: High and individual positive endexpiratory pressure (PEEP) during laparoscopic surgery may improve oxygenation and respiratory mechanics. Goal of this study is to comprehensively evaluate the effects of fixed and individualized PEEP strategies on respiratory mechanics, oxygenation. and hemodynamics in obese patients undergoing laparoscopic surgery.

Materials and Methods: We searched RCTs in PubMed, Cochrane Library, Web of Science, and Google Scholar from January 2000 to December 2023 comparing the different intraoperative PEEP (low PEEP (LPEEP): 0-5 mbar: moderate PEEP (MPEEP): 6-9 mbar; high PEEP (HPEEP): >=10 mbar; individualized PEEP (iP-EEP): PEEP set by special physiological technique) on arterial oxygenation, respiratory compliance (Cdyn) or driving pressure, mean arterial pressure (MAP), and heart rate (HR) in patients during laparoscopic surgery in reverse Trendelenburg position. We calculated mean differences (MD) with 95% confidence intervals (CI), and predictive intervals (PI) using random-effects models. The Cochrane Bias Risk Assessment Tool was applied.

Results and Discussion: 8 RCTs (n=425) met the inclusion criteria. HPEEP vs LPEEP increased PaO₃/FiO₂ (+129.93 [+75.20; +184.65] mmHg, p<0.0001) with high variation of true effect (Chi² 34.92, p< 0.0001; I² 89%). iPEEP vs LPEEP also increased PaO₂/FiO₂ +130.23 [+57.18; +203.27] mmHg, p=0.0005) with high variation of true effect (Chi² 26.95, p< 0.0001; I² 93%). HPEEP vs LPEEP increased Cdyn (+15.06 [5.47; +24.65] ml/mbar, p=0.002) with high variation of true effect (Chi² 93.16, p< 0.0001; I² 96%). iP-EEP vs LPEEP increased Cdyn (+22.46 [+8.56; +36.35] ml/mbar, p=0.002) with high variability of the true effect (Chi² 53.92, p< 0.0001; I² 96%). HPEEP group had higher MAP as compared to LPEEP)+4.36[+0.36;+8.36], p=0.03), variability of the true effect was nonsignificant. HR did not differ between all comparisons.

Conclusion(s): In patients with obesity undergoing surgery in the reverse Trendelenburg position HPEEP and iPEEP may improve oxygenation, decrease driving pressure, and increase dynamic compliance compared to LPEEP with high variation of true effect without relevant hemodynamic compromise. Data with MPEEP comparisons is inconclusive.

33AP02-10

Do patients with obstructive sleep apnea benefit from the use of high-flow nasal cannula during endoscopic retrograde cholangiography procedures? A randomized controlled trial

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Background and Goal of Study: Sedation during endoscopic retrograde cholangiography procedures (ERCP) increases the risk of hypoxemia and the need for respiratory support in Obstructive Sleep Apnea (OSA) patients. High-flow nasal cannula (HFNC), generates a positive end-expiratory pressure (PEEP) effect and may reduce hypoxemia during ERCP but the is not strongly evidenced.

Therefore, we aim to evaluate if HFNC improves pulmonary gas exchange compared to standard nasal cannula (NC) in OSA patients.

Materials and Methods: Randomized control trial, in patients undergoing ERCP with CO₂ insufflation at a tertiary hospital. After completing STOP Bang questionnaire, patients were randomized 1:1 with OSA stratification to either HFNC (60L min-1, Fio., 0.4) or NC (6L min-1). The procedures were performed under deep sedation with propofol and remifentanil target-controlled infusion. ECG, SpO₂, blood pressure, bispectral index (BIS), rescue airway maneuvers, and transcutaneous CO2 (TcPCO2). Additionally, a venous blood sample was obtained at the end of the procedure. The primary outcome was the occurrence of hypoxemic events defined as SpO₂ ≤ 90% during 15 s. The secondary were the need for airway rescue maneuvers and hypercapnia, defined by the maximum TcCO₂ values recorded.

Results and Discussion: A total of 191 patients were included in the analysis (73 OSA and 118 non OSA). 74 (38%) were females and 117 (62%) males with a median age of 67 [IQR, 57-79] v.o., and a body mass index of 25 [22-22] kg/m². 55% were ASA III. There were 8 hypoxemic events in OSA patients and 19 in non-OSA patients. In both groups, HFNC showed a tendency to reduce hypoxemic and the need for airway rescues events. Moreover, significantly reduced TcPCO2 values and venous PCO2 in both OSA and non-OSA patients, with this difference being more pronounced in OSA patients (Table 1).

Variable	0	SA (n=73)		Non-OSA (n=118)			
	HFNC (n=37)	NC (n=36)	P value	HFNC (n=55)	NC (n=63)	P value	
Hypoxemic events (SpO ₂ <90%), n	3 (8)	5 (14)	0.634	8 (15)	11 (18)	0.452	
Airway rescue events, n	12 (32)	17 (47)	0.202	12 (22)	23 (37)	0.080	
PtCO ₂ , mmHg	44.3 [30.4-69.7]	50.8 [18.7-94.9]	0.042	44.9 [10.9-61]	47.8 [27.9-129.5]	0.022	
PvO ₂ , mmHg	76.7 [62.1-101.7]	72.0 [56.3-91.8]	0.020	89.9 [64.8-113.1]	78.6 [62.5-110.0]	0.029	

The qualitative data are presented as n(%), and the numerical data are presented as the median [IQR]

Table 1.

Conclusion(s): In OSA patients undergoing ERCP, HFNC did not significantly reduce the incidence of hypoxemic events or the need of airway rescue maneuvers. However, HFNC significantly reduced patients' hypercapnia.

33AP02-11

Association of mechanical power with mortality in patients with ARDS: An individual patient data analysis

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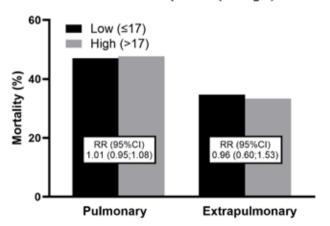
Background and Goal of Study: Mechanical power is associated with outcomes from acute respiratory distress syndrome (ARDS) (1,2). Pulmonary and extrapulmonary ARDS have distinct pathophysiological mechanisms, which may alter the impact of mechanical power on patient outcomes (3.4).

We aimed to assess the relationship between mechanical power and ARDS etiology on 60-day mortality.

Materials and Methods: Individual patient data analysis of six observational studies of mechanical ventilation in patients with ARDS. The primary endpoint was mortality at day 60 after start of invasive mechanical ventilation. Other outcomes included length of stay in hospital and ICU, duration of ventilation and ventilatorfree days at day 28.

Results and Discussion: Out of 7.934 patients with ARDS from either pulmonary or extrapulmonary etiology, 4.532 (57%) patients were survivors and 3.402 (43%) non-survivors. Mechanical power was independent associated with 60 day-mortality (P=0.004). There was no significant interaction between mechanical power and etiology of ARDS (P=0.39). Other respiratory factors associated with 60-day mortality included respiratory rate (P<0.001) and driving pressure (P<0.001).

Mechanical power (cmH₂O)



Conclusion(s): Mechanical power is independently associated with 60-day mortality in patients with ARDS receiving mechanical ventilation. There is no significant interaction between mechanical power and etiology of ARDS on mortality.

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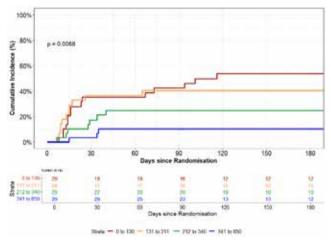
33AP03-1

The platelet glycoprotein lb-alpha receptor is a biomarker for ARDS mortality

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Background and Goal of Study: Immunothrombosis describes the process of platelet activation during inflammation. It partakes in organ and tissue damage through formation of mircothrombi. The glycoprotein receptor GPIb-α binds von-Willebrand factor (vWF) and potently mediates crosslinking of platelets. In a prospective cohort study in ARDS patients, we measured GPIb-□ serum levels on five consecutive days to determine its usage as a biomarker in ARDS fatality.

Materials and Methods: GPIb- α serum levels were measured on five consecutive days after study inclusion in 125 patients in a prospective multicenter trial. A multivariate Cox analysis was performed to identify risk factors for increased mortality. GPIb- α serum levels were compared between survivors and non-survivors via student's t-test. A Kaplan Meyer curve was created, stratified by GPIb- α levels which were compartmentalized by quartiles.



Results and Discussion: Diminished GPIb- α serum levels were identified as independent risk factor for increased mortality in our cohort. GPIb-α levels were significantly higher in survivors compared to non-survivors on day 3-5 after study inclusion. For the Kaplan-Meyer curve, patients with the lowest GPIb- α levels (0130 ng/mL) had a mortality rate of 53%; in patients with higher levels (341-850 ng/mL), the mortality rate was 10% (Fig. 1). Taken together, we are the first to report of GPIb- α as a biomarker with significance in ARDS. Lower levels are independently associated with an increased mortality, which might reflect increased consumption of GPIb- α during fatal ARDS.

Conclusion(s): GPlb- α might hold the potential to be a predictor for mortality in ARDS, with lower levels bringing with it a higher risk of death.

33AP03-2

Hypercapnia in Robotic Assisted Thoracic Surgery (RATS) for thymectomy: a new anesthetic challenge

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Background and Goal of Study: RATS thymectomy (RT) is a recently introduced technique. We observed respiratory acidosis (RA) secondary to capnothorax in many patients undergoing RT. Considering that hypercapnia can lead to both intraoperative and postoperative complications, we decided to conduct this retrospective observational study to review a cohort of patients undergoing RT and describe their characteristics in order to identify potential risk factors for the development of severe intraoperative RA in further studies.

Materials and Methods: Retrospective review of patients undergoing RT from October 2022 to October 2024 in a tertiary hospital center. Demographic (age, sex) and clinical data (presence of obstructive respiratory pattern, bronchial hyperresponsiveness, myasthenia gravis, surgery length, occurrence of complications) were analyzed for all patients. In the subgroup who developed intraoperative hypercapnia measured by etCO2, arterial blood gases were obtained to measure pCO2 and ph.

Results and Discussion: The table shows the data obtained. Regarding complications, all patients were immediately extubated after surgery, although one of them required intraoperative ventilation with Evone® and postoperative noninvasive mechanical ventilation.

	Total sample (n=20)	Hypercapnia gr (n=13)	roup	Normocapnia group (n=7)
Age, Mean (years)	52,4 (23-80)	49,8 (23-80))	57,3 (31-79)
Men (%) Women (%)	30% 70%	38% 62%		14% 86%
Surgery length, Mean (minutes)	192 (100-340)	207 (100-315	5)	164 (120-340)
Myasthenia gravis (%)	25% (5/20)	31% (4/13)		14% (1/7)
Obstructive pattern (%)	25% (5/20)	31% (4/13)		14% (1/7)
Bronchial hyperreactivity (%)	20% (4/20)	23% (3/13)		14% (1/7)
		Mild (45-60 mmHg) (%)	38% (5/13)	-
		Moderate (61-74 mmHg) (%)	54% (7/13)	-
Hypercapnia (%)	65%	Severe (>75 mmHg) (%)	8% (1/13)	-
ттурстсартна (70)	(13/20)	Maximum arterial pCO2, Mean (mmHg)	62,8 (49,1-82,9)	-
		Minimum arterial ph, Mean	7,24 (7,16-7,33)	-

Conclusion(s): RT may be associated with the development of intraoperative hypercapnia, and this may be due to the need for high-pressure capnothorax (conditioning increased airway pressures) and to the sealed robotic ports, thus leading to increased CO2 absorption.

In this cohort there were more patients with hypercapnia than not, and among those with hypercapnia it seems to be a higher percentage of women, bronchial hyperresponsiveness and a longer duration of surgery. However, the main limitation of this study was the small sample size, so larger studies should be performed in order to draw firm conclusions.

33AP03-3

Development and validation of interpretable machine learning models for postoperative pneumonia prediction

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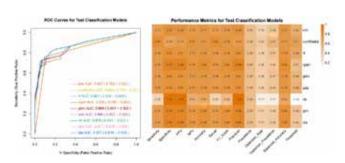
Background and Goal of Study: Postoperative pneumonia, a prevalent form of hospital-acquired pneumonia, poses significant risks to patients' prognosis and even their lives.

This study aims to develop and validate a predictive model for postoperative pneumonia in surgical patients using nine machine learning methods.

Materials and Methods: Retrospective data from electronic medical records was collected for 264 patients diagnosed with postoperative pneumonia and 264 healthy control surgical patients. Through correlation screening, chi-square tests, and feature importance ranking, 47 variables were narrowed down to 5 potential predictive factors based on the main cohort of 528 patients.

Nine machine learning models, including k-nearest neighbors, support vector machine, random forest, decision tree, gradient boosting machine, adaptive boosting, naive bayes, general linear model, and linear discriminant analysis, were developed and validated to predict postoperative pneumonia.

Model performance was evaluated using the AUC, sensitivity, specificity, accuracy, precision, recall, and F1 score. A distribution plot of feature importance and feature interaction was obtained to interpret the machine learning models.



Results and Discussion: Among 17,190 surgical patients, 264 (1.54%) experienced postoperative pneumonia, which resulted in adverse outcomes such as prolonged hospital stay, increased ICU admission rates, and mortality. We successfully established nine machine learning models for predicting postoperative pneumonia in surgical patients, with the general linear model demonstrating the best overall performance. The AUC of the general linear model on the testing set was 0.877, with an accuracy of 0.82, specificity of 0.89, sensitivity of 0.74, precision of 0.88, and F1 score of 0.80. Our study revealed that the duration of bed rest. unplanned re-operation, end-tidal CO2, postoperative albumin, and chest X-ray film were significant predictors of postoperative pneumonia.

Conclusion(s): Our study firstly demonstrated that the general linear model based on 5 common variables might predict postoperative pneumonia in the general surgical population.

33AP03-4

Postoperative pulmonary complications (PPCs) in gynaecological and urological patients. Does type of surgery matter?

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Background and Goal of Study: In lower abdominal surgery, postoperative pulmonary complications (PPCs) are known to occur less often in gynaecological patients compared to urological patients. It is unclear whether this is due to PPC predicting variables at baseline, or to type of surgery itself.

Materials and Methods: Post hoc analysis of LAS VEGAS, an international observational study in patients undergoing intraoperative ventilation during general anaesthesia for surgery.

The primary endpoint was the incidence of any PPC, a composite endpoint of six individual PPCs.

The secondary endpoint was individual PPC incidence.

The composite included unplanned supplemental oxygen, pneumothorax, pneumonia, respiratory failure, new invasive ventilation and ARDS. To evaluate the role of surgery type, propensity score matching was used to create a cohort of patients with similar preoperative PPC risk.

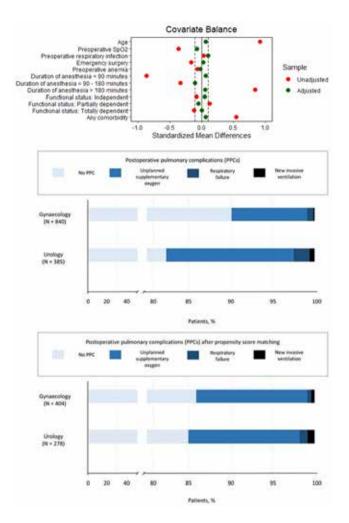
Variables with a known association with PPCs were implemented in the model and a Fisher's exact test was used for hypothesis testing.

Results and Discussion: The unmatched cohort consisted of 1225 patients; 840 (68.6%) gynaecological and 385 (31.4%) urological patients. Gynaecological patients were younger, had fewer comorbidities and shorter length of anesthesia. The incidence of PPCs was lower in gynaecological patients (9.8% vs 17.9%; OR 0.50[0.35-0.71]; P < 0.001).

Pneumonia, pneumothorax and ARDS did not occur. The incidence of unplanned supplementary oxygen was lower in gynaecological patients. After matching, covariates were well balanced. The matched cohort consisted of 404 (59.2%) gynaecological and 278 (40.8%) urological patients. Both composite PPC incidence (13.4% vs 15.1%; OR 0.87 [0.55-1.38]; P = 0.596), and individual PPC incidence were not different between groups.

	Unmato	hed cohort		Match	ed cohort	
	Gynaecological (N = 840)	Urological (N = 385)	Р	Gynaecological (N = 404)	Urological (N = 278)	Р
Any PPC, n (%)	82 (9.8)	69 (17.9)	< 0.001	54 (13.4)	42 (15.1)	0.596

Table 1: PPCs in gynaecological and urological patients



Conclusion(s): In lower abdominal surgery, gynaecological patients have a lower incidence of PPCs. However, this is likely due to pre-operative PPC risk rather than type of surgery itself.

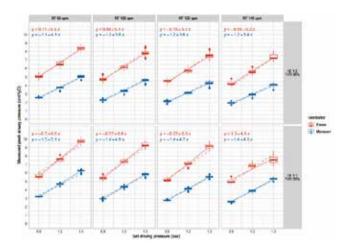
33AP03-5

A bench study comparing peak airway pressures during high frequency jet ventilation with two commercially available jet ventilators

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Background and Goal of Study: Jet ventilators inject low tidal volumes at high respiratory frequencies (RF) and at high driving pressures (DP). In this bench study we compared the peak airway pressures (PAP) between two jet ventilators (Monsoon IV, Acutronic Medical Systems AG, Hirzel, Switzerland and Evone, Ventinova Medical, Bizkaia, Spain). Clinical experience led us to hypothesize that the Evone produces higher PAPs at the same DP.

Materials and Methods: An oral WEI jet tube (Well Lead Medical Ltd., China) was interfaced with a 1 litre test lung (IMT Medical Easylung, IMT Analytics AG, Buchs, Switzerland, compliance 25mL/ H_oO, resistance 20cm H_oO/L/s). Airway pressures were measured in the lung, distal to the jet flow, on an indwelling non-compliant line. The ventilators were tested at room temperature with dry air for a range of settings: RF 80, 100, 120, 140 cpm; DP 0.9, 1.2, 1.5 bar and I:E ratios of 1:1 and 1:2 (Monsoon) and inspiratory time fractions (Ti/Tt) of 50% and 35% (Evone). Data was sampled at 250Hz (clip-on cap, Sensirion, Staefa, Switzerland), recorded for 2 minutes at each setting, filtered for peaks and linearly modelled ('R', v4.4, R consortium, Vienna, Austria).



Results and Discussion: The boxplot figure shows the spread of PAPs for each combination of settings. Full lines with equations (top left) represent linear models per scenario. Dashed lines are predictions from a linear regression model on all settings (R2=0.98), summarized as: PAP = 5.6*DP - 0.02*RF + 5.8*Ti/Tt - 1.7*monsoon - 1.3*DP*monsoon + 0.005*RF*monsoon - 0.3*Ti/ Tt*monsoon - 0.5.

PAP increased at higher DP or longer T/T, (p<.001), but decreased with increasing RF (p<.001). PAPs were higher with the Evone than with the Monsoon (p<.001) and increased disproportionally at higher DP (p<.001).

Conclusion(s): Compared with the Monsoon IV, the Evone generates higher PAP at similar DP and results in proportionally larger increases in PAP at higher DP. The reasons for these differences require further investigation. Studies are also necessary to determine the clinical relevance of these findings and their implications for ventilator settings and gas exchange in vivo.

33AP03-7

Impact of standard and prolonged prone positioning on ventilator-free days, mortality, and respiratory mechanics in COVID-19-associated **ARDS:** a retrospective cohort study

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Introduction: Prone positioning (PP), high levels of PEEP, low tidal volume, and reduced driving pressure (DP) are recommended treatments as part of lung-protective ventilation in ARDS.

The aim of this study is to investigate the impact of prolonged prone positioning (PPP) and standard prone positioning (SPP) on ventilator-free days (VFD) and ICU mortality in patients with Covid ARDS.

Additionally, the effects of PPP and SPP on respiratory mechanics and oxygenation indices during the pre-prone, prone, and postprone periods will be compared.

Materials and Methods: We divided patients into two groups: Group A (n:149) (received PP for 16-24 hours) and Group B (n:168) (received PP for 25-36 hours). Arterial blood gas parameters were collected within 2 hours before PP, every 4 hours during PP, and within 2 hours after PP. Hemodynamic parameters, respiratory mechanics (FiO 2, PEEP, PaO, /FiO, ratio, oxygenation index (OI), oxygen saturation index (OSI), Mp tot , MP dyn , RR, PEEP, TV_e, MV_e, P_{mean}, P_{peak}, WOB_v, I/E ratio, compliance, DP), laboratory parameters, ICU length of stay, VFD, and Norepinephrine total daily dosage were recorded.

Results: In Group A, there was a statistically significant decrease in HR, PCO₂, OI and OSI during the prone and post-prone periods. Additionally, there was a statistically significant increase in PH, PaO₂/FiO₂ ratio and PF/PEEP values.

In Group B, there was a statistically significant decrease in HR, OI and OSI values during the prone and post-prone periods. Additionally, there was a statistically significant increase in PH, PaO /FiO₂ ratio, and PF/PEEP values.

In Group A, a statistically significant difference was found between the survivor and non-survivor groups in terms of age, total daily norepinephrine dose, K levels, P peak , DP, MP tot , MP dyn , ICU stay and VFD.

In Group B, a statistically significant difference was found between the survivor and non-survivor groups in terms of age, MAP, total daily norepinephrine dose, PCO2, PH, lactate, PaO, /FiO, ratio, OI, OSI, PF/PEEP, P mean, P peak, DP, MP tot, MP dyn, WOBy, compliance, prone duration, and APACHE II and SOFA scores at admission, ICU stay and VFD.

Conclusion: In C-ARDS patients, preventing VILI and achieving a persistent post-prone effect through several sessions of PP have positive effects on respiratory mechanics and oxygenation. We recommend incorporating both SPP and PPP as part of lung protective ventilation rather than as life-saving treatments.

33AP03-8

Mechanical ventilation practices in surgical ICU: a monocentric prospective study

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Background and Goal of Study: Mechanical ventilation (MV) is essential in critical care to support patients with acute respiratory failure, impaired consciousness, or prolonged anesthesia requirements. However, its use is associated with risks, including pulmonary injuries, nosocomial infections, and hemodynamic disturbances.

This study aimed to evaluate MV practices in the surgical ICU at CHU Ibn Rochd, focusing on indications, complications, ventilatory modes, and patient outcomes

Materials and Methods: A prospective descriptive study was conducted from September 2022 to September 2023, including 42 patients requiring MV. Data collected included MV indications, ventilatory parameters, duration, complications, and weaning outcomes. Statistical analyses assessed correlations between patient characteristics, MV practices, and clinical outcomes.

Results and Discussion: Among the 42 patients, the mortality rate was 52.38%, primarily due to septic shock (72.72%). The average MV duration was 7.97 days. Although demographic factors did not significantly influence outcomes, pre-existing medical conditions were associated with increased mortality risk (P=0.032).

Complications occurred in 66.66% of patients, primarily infections (33.33%) and renal issues (23.80%), but these had no significant impact on prognosis (P=0.252). Ventilatory parameters included tidal volumes of 6-8 ml/kg and peak pressures of 20-30 cmH2O in 83.88% of cases.

Prolonged MV duration correlated with older age (P=0.048) and altered consciousness (P=0.0311). Weaning was successful in 90.90% of patients ventilated for 7 days or more (P=0.0197). These findings highlight the need for individualized MV management and early identification of risk factors to improve outcomes. Conclusion(s): Optimizing MV practices and ensuring rigorous monitoring are critical to improving clinical outcomes and reducing mortality in ICU patients. Future efforts should focus on refining protocols to minimize complications and enhance weaning success rates.

33AP04-1

Evaluation of the respiratory effects of driving pressure-guided mechanical ventilation using electrical impedance tomography in patients undergoing robot-assisted laparoscopic radical prostatectomy

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Background and Goal of Study: Due to factors such as the Trendelenburg position and pneumoperitoneum applied during robotassisted laparoscopic radical prostatectomy (RALRP), postoperative pulmonary complications (PPCs) may occur.

The aim of our study is to evaluate the effects of personalized PEEP, based on driving pressure approach, versus fixed PEEP on lung gas distribution during RALRP using electrical impedance tomography (EIT), and to compare postoperative pulmonary complications (PPCs).

Materials and Methods: Our study is a randomized, controlled, prospective study, registered to ClinicalTrials.gov with the identification number NCT06540794. The study was conducted with 42 patients undergoing RALRP. Patients aged 18 to 80 years with an ASA score of 1 to 3 were included. In control group (Group S), standard-fixed PEEP of 5 cmH₂O was applied. "Personalized" PEEP value, which provided the lowest driving pressure as a result of decremental PEEP titration, was applied in the study group (Group K) The GI index and ROI3+ROI4 values, as well as PPC rates, were compared. Data analyses were conducted using IBM SPSS Statistics 21.0 and MS Excel 2007, with statistical significance set at p < 0.05.

Results and Discussion: The patient characteristics, hemodynamics, and surgery-related variables were similar in both groups. The GI indices were significantly lower in Group K at T5 and T6 (p<0.05), indicating more homogeneous ventilation in study group (Table 1). An increase in ROI3+ROI4 values, indicating enhanced dorsal ventilation, was observed in Group K compared to Group S at T5 (40.30 \pm 13.16 vs. 31.95 \pm 9.10, respectively; p < 0.05).

Our study demonstrated that personalized PEEP reduced PPCs. with a PPC rate of 26.1% in the personalized group compared to 63.2% in the standard group (p<0.05).

	GROUP K	GROUP S		
	(personalized PEEP) (n=23)	(standard PEEP) (n=19)		
	Mean ± SD	Mean ± SD	p (0	Group)
GI Index				
T0- Preinduction	0.40±0.03	0.39±0.03	t=0.673	p=0.505
T5- Before Extubation	0.40 ± 0.04	0.44±0.04	z=3.269	p=0.001
T6- After Extubation	0.38±0.03	0.43±0.03	z=4.152	p<0.001
p(time): $\chi^2=11.590$; p=0.0	003	F=16.176; p<0.001		

t: Independent Samples T-Test, z: Mann-Whitney U Test, χ^2 : Friedman Test, F: Repeated Measures ANOVA Test

Table 1. Comparison of GI index values by groups

Conclusions: In patients undergoing RALRP, driving pressureguided personalized PEEP provides more homogeneous lung ventilation compared to fixed PEEP, as demonstrated by the GI index calculated through EIT. It was concluded that personalized PEEP application reduced PPCs.

33AP04-2

Challenging use of anesthetics in the treatment of refractory bronchospasm in a patient with intracranial hemorrhage

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Background: Bronchospasm can be a life-threatening complication of invasive mechanical ventilation and its standard management in the ICU includes the use of nebulized bronchodilators, intravenous corticosteroids, and specific ventilator settings. If bronchospasm is refractory to standard treatment, additional therapeutic options include intravenous salbutamol, magnesium and aminophylline, paralysis, mucolytics, ketamine, inhalational anesthetic agents, heliox, and ECMO1.

The choice of additional treatment may be influenced by scarcity of resources and the patient's comorbidities.

Case Report: A 32-year-old woman with BMI of 49.3, without comorbidities, was admitted to the University Hospital Brno with a subarachnoid hemorrhage (Hunt-Hess grade II) caused by a rupture of an aneurysm of the anterior communicating artery. The aneurysm was scheduled for endovascular coiling under general anesthesia.

Following the induction of anesthesia, the patient developed severe bronchospasm, which was refractory to standard treatment. Ventricular dilatation complicated the situation, necessitating cerebrospinal fluid drainage via an external ventricular drain. The bronchospasm remained profoundly refractory to advanced treatment.

Despite the risk of intracranial pressure elevation, inhaled sevoflurane and intravenous ketamine were successfully utilized, leading to improved ventilation without any increase in intracranial pressure.

Discussion: Refractory bronchospasm presents a challenge, particularly in the context of intracranial hemorrhage and the risk of elevated intracranial pressure. The use of ketamine, whose effect on intracranial pressure remains unclear, is a potential alternative2.

The use of sevoflurane, which may increase intracranial pressure. can be challenging; however, we found it to be feasible and safe when intracranial pressure is carefully monitored.

References:

- 1. Gayen S, Dachert S, Lashari BH, et al. Critical Care Management of Severe Asthma Exacerbations. Journal of Clinical Medicine.2024: 13(3):859.
- 2. Gregers, M.C.T., Mikkelsen, S., Lindvig, K.P. et al. Ketamine as an Anesthetic for Patients with Acute Brain Injury: A Systematic Review. Neurocrit Care 33, 273-282(2020).

Learning Points: Treatment of refractory bronchospasm is challenging and influenced by the underlying illness and comorbidities. In patients with risk of high intracranial pressure the use of ketamine and sevoflurane is both feasible and safe if intracranial pressure is monitored.

33AP04-3

Flow control ventilation in robotic laparoscopic surgery and steep Trendelenburg positioning: case report

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Background: Trendelenburg positioning during robotic-assisted laparoscopy associates reduced pulmonary compliance, atelectasis and worsened oxygenation 1.

Flow-controlled ventilation (FCV) employs a linear gas flow during both inspiration and expiration, reducing airway pressure fluctuations, dissipative energy and alveolar strain. Furthermore, active control of expiration with FCV allows better lung recruitment and oxygenation¹. However, its application in robotic surgery with Trendelenburg positioning remains unexplored.

Case Report: Patient 1: 72-year-old (y/o) man, body mass index (BMI) 26 kg/m2, ASA 2, scheduled for robotic cystectomy. Patient 2: 56 y/o man, BMI 25 kg/m2, ASA 2, scheduled for robotic prostatectomy. A radial arterial catheter was inserted prior to induction. Total intravenous anesthesia was administered.

After intubation, patients were ventilated with volume control ventilation (VCV), positioned in 32° Trendelenburg position and then switched to FCV and returned to VCV before emergence. During FCV, the anesthetist adjusted flow rate (F), positive endexpiratory pressure (PEEP), peak inspiratory pressure (PIP), and the fraction of inspired oxygen (FiO2). An exclusive pressure line

				Patient 1							Patient 2			
Surgery	Basal		peritoneum	FCV pneumo- peritoneum -and Trende- lenburg	FCV end surgery	VCV end surgery	30' PACU	Basal		peritoneum	FCV pneumo- peritoneum -and Trende- lenburg	FCV end surgery	VCV end surgery	30' PACU
RR	-	12	12	14	8	14	24	-	12	12	12	8	12	22
VT (mL)	_	512	508	376	896	520	_	_	505	496	489	726	520	_
F (L/min)	-	6,2	12	10	10	7,3	-	-	6,1	12	12	12	6,2	-
PEEP (mbar)	-	8	8	8	8	8	-	-	8	8	8	8	8	-
PIP (mbar)	-	15	25	20	20	22	-	-	17	22	20	22	22	-
PaCO ₂ (mmHg)	34	36	41	47	51	51	35	37	36	42	42	41	42	37
PaO ₂ / FiO ₂	314	416	364	292	398	380	433	623	400	432	468	504	370	566

continuously measured airway pressure. The device determined the respiratory rate (RR) and tidal volumes (TV) based on the compliance of the respiratory system. No postoperative respiratory complications were observed.

Ventilatory and gas exchange parameters are shown in Table 1. **Discussion:** In these cases, FCV improved intraoperative airway pressure ensuring an adequate gas exchange during robotic laparoscopic surgery suggesting that FCV may reduce the negative effects of pneumoperitoneum and Trendelenburg positioning. Large-scale studies are needed to assess FVC role in enhancing perioperative respiratory care during these surgeries.

Reference:

1. Intensive Care Med Exp. 2023;11(1):49.

Learning points: FCV may be a promising ventilation strategy in patients undergoing robotic surgery.

33AP04-4

Atelectasis in major abdominal surgeries and the role of two different ventilation modes in decreasing it

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Background and Goal of Study: Atelectasis is a common postoperative complication following open abdominal surgeries, caused by decreased functional residual capacity (FRC) due to factors like abdominal pressure, anaesthesia, and neuromuscular blockade. Pressure support ventilation (PSV) is proposed to reduce atelectasis by assisting breathing and maintaining adequate FRC. While PSV has shown effectiveness in laparoscopic and bariatric surgeries, there is limited evidence for its use in major abdominal surgeries.

This study compares PSV to spontaneous ventilation with intermittent manual assistance (control group) in patients undergoing major open abdominal surgeries.

Lung ultrasound (LUS) is used to assess atelectasis in both groups. The study hypothesizes that PSV during extubation will reduce the incidence of postoperative atelectasis compared to the control group.

Materials and Methods: In this randomized controlled doubleblinded trial, adult patients undergoing major abdominal surgeries were assigned to either the pressure support (n=67) or the control group (n=67). During emergence PSV was used in the pressure support group versus intermittent manual assistance in the control group.

Results and Discussion: The incidence of atelectasis at 30 minutes after extubation in PACU was significantly lower(16%vs 40% in Control) with p value of 0.003.PaO levels in the Pressure support group was significantly higher than the control group(88.4±10.6 mmHg vs 80.16 ±10.93 mmHg) with a p value<.0001. Events of SpO₂<92% and the need for oxygen support in PACU was significantly lower in the pressure support (27%vs

No significant difference was found in the incidence of atelectasis 24 hours after extubation, SpO₂<92% 48 hours after surgery, need for mechanical ventilation, CPAP or HFNO support, extubation time, postoperative pulmonary complications, duration of hospital stay between both groups.

Conclusion(s): This study demonstrates that PSV during emergence and extubation significantly reduces the incidence of postoperative atelectasis and improves oxygenation compared to control group.

33AP04-5

Perioperative pneumothorax: a case of hypoxemia following breast surgery

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Background: Pneumothorax is a well-recognized complication of breast surgery, with an incidence below 1%(1). Primary causes include local anesthetic infiltration, tissue expander placement and positive-pressure ventilation.

Case Report:: A 48-year-old female (ASA II) with ductal carcinoma underwent a right mastectomy and immediate reconstruction with tissue expander under general anesthesia with endotracheal intubation and PECS block. PECS blocks were performed under ultrasound, without problems. The surgery proceeded without complications but expander fill was difficult requiring multiple attempts.

During emergence, the patient desaturated. In the hypothesis of bronchospasm, deepening anesthesia, salbutamol, ipratropium and manual positive pressure ventilation were made. Pulmonary auscultation was normal and oxygen saturation improved.

The patient was extubated but required supplemental oxygen (FiO2 50%) to SpO2>92%. In the post-anesthesia care unit, despite hemodynamic stability, the patient remained hypoxemic and dyspneic.

Lung auscultation revealed decreased breath sounds in the right hemithorax. A chest X-ray confirmed right pneumothorax and a chest drain was placed. Follow-up image showed resolution within 8 hours and the patient was discharged on postoperative day 3. Discussion: Anesthesiologists must recognize iathrogenic pneumothorax as a potential complication of breast surgery. In this case, the patient presented with hypoxemia and dyspnea. Differential diagnoses included bronchospasm, negative pressure pulmonary edema and pneumothorax, with bronchospasm ruled out due to lack of response to treatment and suggestive pulmonary auscultation.

Imaging confirmed pneumothorax, likely caused during expander insertion. PECS block was a less probable cause due to the absense of complications during the technique: US-guided with correct visualization of the needle and dispersion of local anesthetic while maintained intraoperative stability despite positive pressure ventilation.

Reference:

Schneider LF et al.Incidence of pneumothorax during tissue expander-implant reconstruction and algorithm for intraoperative management. Ann Plast Surg. 2014 Sep; 73(3):279-81

Learning points: Anesthesiologists must be vigilant for pneumothorax as a potential cause of hypoxemia and respiratory distress in breast surgery patients. Possible etiologies include needle injury during local anesthetic infiltration, multiple attempts at tissue expander insertion and mechanical ventilation.

33AP04-6

Challenges in pulmonary veno-occlusive disease: ECMO as a bridge to double-lung transplantation

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Background: Pulmonary veno-occlusive disease (PVOD) is a rare and aggressive subtype of pulmonary arterial hypertension characterized by pulmonary venous involvement, progressive pulmonary vascular resistance, hypoxemic respiratory failure and right ventricular failure. PVOD has a poor prognosis, limited response to standard PAH therapy with a high risk of severe pulmonary edema. Lung transplantation is the definitive treatment and should be considered at diagnosis [1].

Case Report: We present a 28-year-old male diagnosed with hereditary PVOD in 2020, confirmed by EIF2AK4 mutation. He declined lung transplantation due to personal reasons and was treated with dual oral vasodilator therapy and diuretics.

Over three years, his condition worsened with recurrent hospitalizations for decompensated right heart failure. In 2024, he presented in cardiogenic shock with suprasystemic pulmonary pressures and persistent low output despite inotropic support. Femorofemoral veno-arterial ECMO was initiated as a bridge to transplantation. Six days later, he underwent double-lung transplantation with CPB.

Intraoperatively, he experienced severe hemodynamic instability requiring vasoactive drugs and politransfusion. He was transferred to the ICU with VA ECMO and vasoactive drugs, where he experienced a slow but favorable progression.

Discussion: PVOD poses unique diagnostic and therapeutic challenges due to its aggressive progression and poor response to vasodilator therapy. This case emphasizes the importance of early recognition and timely initiation of advanced support measures, such as ECMO, to stabilize patients awaiting transplantation.

Early recognition, patient education, and timely decision-making are critical to optimizing outcomes. Lung transplantation remains a life-saving intervention for PVOD patients.

References:

1. Sourla E, Paspala A, Boutou A, Kontou P, Stanopoulos I, Pitsiou G. A case of pulmonary veno-occlusive disease: diagnostic dilemmas and therapeutic challenges. Ther Adv Respir Dis. 2013 Apr;7(2):119-23 doi: 10.1177/1753465812468042. Epub 2012 Dec 12. PMID: 23235992.

Learning points: PVOD is a rare and aggressive cause of PAH with limited response to standard therapies, necessitating early consideration of lung transplantation. ECMO serves as a vital bridge to transplantation in patients with refractory hemodynamic deterioration. Meticulous perioperative planning is essential to manage hemodynamic challenges and prevent catastrophic complications.

33AP04-8

Flow-controlled ventilation in morbidly obese patients during laparoscopic surgery – two case

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Background: Obesity decreases functional residual capacity that is impaired during general anaesthesia, leading to mechanical ventilation difficulties and respiratory complications. Flow-controlled ventilation (FCV) ventilator delivers a steady inspiratory flow of air and actively controls expiration, without flow pauses. Linearisation of airway pressure variation showed to improve lung recruitment1. There is no evidence about the use of FCV in morbidly obese patients having laparoscopic bariatric surgery.

Case Report: Patient 1: 48-year-old woman, body mass index (BMI) 58 Kg/m2, ASA 3, scheduled for sleeve gastrectomy. Patient 2: 45-year-old male, BMI 64 Kg/m2, ASA 3, scheduled for a Roux-en-Y gastric bypass. We inserted a radial arterial catheter before induction. Total intravenous opioid free anaesthesia and awake fiberoptic intubation were used. Patients were initially ventilated with volume control ventilation (VCV) and then switched to FCV. FCV continuously measures intratracheal pressure through a dedicated pressure line. The anaesthetist configures the flow rate (F), end-expiratory pressure (PEEP), peak inspiratory pressure (PIP), and fraction of inspired oxygen (FiO_a). Respiratory rate (RR) and tidal volumes (TV) are calculated according to the respiratory system's compliance. Ventilatory parameters and gas exchange during surgery are shown in Table 1.

				Patient 1						Patient 2		
Surgery Times	Basal (T0)	VCV (T1)	FCV (T2)	FCV Pneumo- peritoneum (T3)	FCV end surgery (T4)	30′ PACU (T5)	Basal (T0)	VCV (T1)	FCV (T2)	FCV Pneumo- peritoneum (T3)	FCV end surgery (T4)	30′ PACL (T5)
RR, rpm	-	15	18	12	8	24	-	15	24	18	21	22
TV, mL	-	506	433	625	896	-	-	521	395	495	431	-
F, L/min	-	-	15	15	15	-	-	-	20	18	19	-
PEEP, cmH ₂ O	-	8	8	8	8	-	-	8	8	8	8	-
PIP, cmH ₂ O	-	23	24	30	30	-	-	21	20	24	26	-
PaO ₂ ,/ FiO ₂ ,mmHg	510	161	170	290	216	390	390	170	227	290	200	405
PaCO ₂ , mmHg	35	43	42	45	41	45	37	45	45	45	58	52

Table 1.

Discussion: In patients with severe obesity, the use of FCV ventilator allows to choose the best ventilatory settings (TV, RR, PEEP) to ensure an adequate gas exchange during abdominal laparoscopic surgery without increasing the PIP. Additionally, our patients improved gas exchange and had no postoperative pulmonary complications. Large-scale studies are essential to thoroughly assess its benefits and define its role in optimizing perioperative respiratory management.

References:

1. BMC Anesthesiol. 2020;20(1):24.

Learning points: FCV might be an option in morbidly obese patients undergoing abdominal laparoscopic surgery.

33AP04-9

Correlation between pixel/global impedance ratio and regional time delay methods for pendelluft calculation in spontaneously breathing patients with acute hypoxemic respiratory failure

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Background and Goal of Study: Pendelluft is a critical factor contributing to patient self-inflicted lung injury (P-SILI). Electrical impedance tomography (EIT) has been used to calculate pendelluft through different methods. The Impedance Ratio (IR) method [1] assesses the ratio between the pixel-level sum of impedance changes and the global impedance signal, while the Time-Based (TB) method [2] evaluates the difference in regional impedance between global and regional nadir. However, there is no consensus on the optimal method, nor is there data on the correlation between their results.

This study aimed to compare the IR and TB methods in spontaneously breathing patients with acute hypoxemic respiratory failure (AHRF) receiving non-invasive respiratory support (NIRS).

Materials and Methods: This prospective, single-center physiological study included patients with AHRF within 24 hours of ICU admission. All patients received NIRS (high-flow nasal cannula or non-invasive ventilation). Demographic, clinical, and outcome data were collected. EIT images were recorded for 20 minutes using a dedicated monitor (Dräger PulmoVista).

Pendelluft was calculated as per Menga et al. [1] for the IR method and Coppadoro et al. [2] for the TB method, expressed as a percentage of global impedance. Correlation between methods was analyzed using Spearman's rank correlation.

Results and Discussion: Eighteen patients (13 males) with a median age of 74 years [65-81], BMI of 27 kg/m² [25-30], and PaO₂/ FiO₂ ratio of 164 mmHg [105-222] were included. Median pendelluft values were 34.9% [21-50] for the IR method and 2.7% [0.6-6.9] for the TB method.

A significant correlation was observed between the methods (Rs = 0.84, p < 0.001), but Bland-Altman analysis revealed a bias of 28.98 ±10.35%.

When patients were classified into high and low pendelluft groups based on median values, both methods provided consistent classifications.

Conclusion(s): The IR and TB methods for pendelluft calculation are correlated in AHRF patients receiving NIRS but show limited agreement in absolute values. Method-specific cutoffs must be considered when interpreting pendelluft results.

References:

- 1. Menga LS, Am J Respir Crit Care Med. 2023;207:1310-23.
- 2. Coppadoro A, Annals of Intensive Care. 2020;10:39.

Acknowledgements: Funded by the European Union - Next-GenerationEU. Project Code 2022SCN8C9 - CUP Code D53D23013750006. PNRR-M4C2- I1.1. PRIN 2022 - ERC sector LS7.

33AP04-10

The distribution of gas during mechanical ventilation appears to be improved with high respiratory rate in patients undergoing robot-assisted radical prostatectomy: initial observations

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Background and Goal of Study: Robotic-assisted surgery is associated with steep Trendelenburg position and pneumoperitoneum, which impair respiratory mechanics. This results in higher postoperative risks. Recruitment maneuvers (RM)and PEEP titration are essential to maintain oxygenation and ventilation (1).

These actions can however compromise circulation. Ventilation with higher respiratory rate (RR) and smaller tidal volume (TV) might be a solution that promotes uniform lung aeration (2) .The goal of our study is to investigate if a higher RR can improve the distribution of the TV.

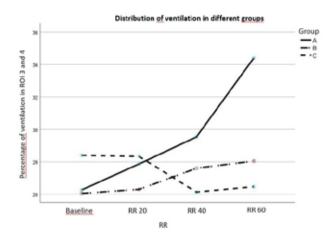
Materials and Methods: We studied ventilation during robotic prostatectomy. In tilted position RR was set to maintain normocapnia during volume-controlled ventilation. The patients were randomized to one of three groups with series of three RR (20, 40 and 60) in various order.

Demographics	Group A RR 20-40-60 (n=3)	Group B 20-60-40 (n=4)	Group C 60-40-20 (n=3)
Age, years (mean)	70	66,3	69,3
BMI, kg/m² (mean)	25,6	26,3	27,6
	ASA 1 (n=1)	ASA 1 (n=2)	ASA 1 (n=1)
ASA-class	ASA 2 (n=2)	ASA 2 (n=0)	ASA 2 (n=2)
	ASA 3 (n=0)	ASA 3 (n=2)	ASA 3 (n=0)

The distribution of ventilation was assessed with electric impedance tomography (EIT), that shows how the TV is distributed between four horizontal regions of interest (ROIs). We studied the % of ventilation reaching the two dorsal ROIs.

Results and Discussion: With the first 10 patients recruited to the trial the distribution of ventilation in ROI 3 and 4 increased from 26.8 % to 29.5% at RR 60. The effect differed between the three groups.

The results indicate that high RR alter the distribution of ventilation. When all participants have been analyzed the study hopefully will give further insights to the subject.



Conclusion(s): The initial observations indicate that RR might influence the distribution of ventilation.

References:

- 1. Chiumello D et al. Ventilation strategy during urological and gynaecological robotic-assisted surgery: a narrative review. Br J Anaesth, 2023:131(4):764-74.
- 2. Retamal JL et al. Preliminary study of ventilation with 4 ml/kg tidal volume in acute respiratory distress syndrome: feasibility and effects on cyclic recruitment - derecruitment and hyperinflation. Crit Care. 2013;17.

33AP04-11

Madrid, Spain

Acute Respiratory Distress Syndrome (ARDS) as a rare complication after pneumonectomy. How can we avoid it?

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Background: Respiratory complications after pneumonectomy (eg. aspiration, pneumonia, and acute respiratory distress syndrome [ARDS]) are a frequent source of morbidity and mortality. They should be proactively prevented and aggressively treated. ARDS after pneumonectomy is a rare complication that occurs in only 4% of cases, however, the mortality rate is over 50%.

Case Report: A 71-year-old male, diagnosed with stage IV colon adenocarcinoma, with antecedent of a median, anterior and atypical lobectomy in the right lung.

In this case, he underwent an iterative right pneumonectomy and was admitted in our ICU.

At 48 hours, the patient experiences desaturation to SatO2 85% despite high-flow nasal prongs (FIO2 70% and 50 bpm), increased respiratory work, left crackles, and initial echocardiography showing good biventricular function with mild RV dilation, allowing an estimated PSP of 40-50 mmHg. At 72 hours, the patient requires sedation and orotracheal intubation due to respiratory deterioration.

Despite optimizing the respiratory parameters of MV, forcing negative fluid balance with continuous venous hemodiafiltration, corticosteroid therapy, vasoactive drugs, and triple pulmonary antihypertensive therapy, respiratory and hemodynamic failure with RV dysfunction persists.

On the 12th postoperative day, the patient showed progressive respiratory deterioration to PAFI 45 and elevated carbon dioxide levels: which led to his death with the main diagnoses of left ARDS associated with RV failure.

Discussion: Prevention of ARDS is a more effective strategy than treatment. Potential causative factors include volutrauma and hyperoxia during intraoperative single-lung ventilation, blood product transfusion, occult infection, occult aspiration, and unrecognized microemboli. Preventive measures in the operating room are based on MV with lung-protective strategies using the lowest FiO2 tolerated. Perioperative fluid administration fluid should be restricted, and the patient should be aggressively diuresed (with vasopressor support if needed). Once ARDS has set in, the only possible treatment is supportive.

References:

Highlight the preventive measures that can be adopted intraoperatively to avoid this rare but potentially lethal

Learning Points: Groth, S. S., et al.(2015). Management of Complications After Pneumonectomy. Thoracic Surgery Clinics, 25(3), 335-348. https://doi.org/10.1016/j.thorsurg.2015.04.006

33AP05-1

Veno-venous ECMO to allow spinal surgery in patient with chronic rejection after bipulmonary transplant

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Background: Patients with chronic rejection after a bipulmonary transplant present unique challenges when undergoing spinal surgery in ventral position especially in terms of ventilation. Venovenous extracorporeal membrane oxygenation (V-V ECMO) is a rescue tool recommended for patients with intact cardiac function with hypoxemic and hypercapnic respiratory failure.1

Case Report: A 66-years-old woman with a medical history of pulmonary transplant in 2011 with chronical rejection, since 2012; presenting with respiratory insufficiency with need of long duration oxygen therapy 2L/min.

The patient presented with fracture of the L3 vertebral body with marked compression of the spinal canal at L3, proposed for urgent kyphoplasty. Due to the patient's comorbidities, surgery positioning and need for organ support in the postoperative period, it was decided to cannulate pre-operatively for venous-venous extracorporeal membrane oxygenation.

The ECMO team, prepared the venous cannulation femoral-femoral in the ECMO unit, with strong fixation of the cannulas due to reposition needed and difficult access to them during surgery. The patient was transferred to the operating room and prepared for surgery.

Standard ASA monitoring, along with invasive arterial blood pressure, central venous pressure and depth of anesthesia monitoring were used and general intravenous anesthesia was induced, a wired endotracheal tube placed, and the patient was mechanically ventilated.

The induction proceeded in dorsal decubitus in the patient's bed and transferred carefully to the surgical bed in ventral decubitus. ECMO team was present during the positioning and the procedure for management and fast approach in case of decannulation with subsequent ultimate risk of severe spinal cord injury or even death. During the surgery, the patient needed one red blood cell concentrate and vasopressor support, with norepinephrine perfusion. The surgery proceeded without further complications and the patient was transferred to the ECMO unit.

Discussion: V-V ECMO ensures adequate gas exchange, lowers the risk of further damage to transplanted lungs and stabilizes respiratory parameters during a high-risk procedure.1

Reference:

1. Prasad A., Scialpi S. ATOTW 514 - Basics of ECMO: Part 1 (16 January 2024)

Learning points: V-V ECMO can be a lifesaving adjunct, should be used as a tool to allow certain high-risk procedures, after carefully balance the thrombotic and bleeding risk to optimize outcomes.

33AP05-2

Inhaled milrinone: an option in patients with pulmonary hypertension in non-cardiac surgery

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Background: Non cardiac surgery in patients with pulmonary hypertension (PH) is increasing and the estimated mortality after emergent general surgery is high (15-50%)1.

There are no evidence-based recommendations on the use of specific inhaled pulmonary vasodilators in the intraoperative period for non-cardiac surgery.

Case Report: We present a case of a 51 year-old woman with severe type IV pulmonary hypertension (PSAP 70 mmHg) chronically treated with sildenafil that underwent emergent laparotomic incisional hernia repair.

Under ASA standard monitoring and invasive blood pressure monitoring, 5 mg of inhaled milrinone was administered in conjunction with intravenous norepinephrine.

Anesthetic induction was performed with alfentanil, ketamine and etomidate and maintenance was carried out with sevoflurane and remifentanil perfusion. No complications related to PH occurred during surgery or in the postoperative period.

Discussion: Patients with PH undergoing non cardiac surgery are at increased risk of acute right ventricular (RV) failure and fatal complications². Milrinone is a selective phosphodiesterase-3 inhibitor which increases the cyclic adenosine monophosphate levels of smooth muscle cells. It has been used as an additional pulmonary vasodilator therapy in cardiac surgery and in neonates with pulmonary hypertension. In its inhaled form, milrinone causes selective pulmonary vasodilation, improving the V/Q ratio. Additionally, it has positive inotropic properties, increasing cardiac output, while minimizing adverse effects such as hypotension3.

References:

- 1. Price L, et al. Perioperative management of patients with pulmonary hypertension undergoing non-cardiothoracic, nonobstetric surgery: a systematic review and expert consensus statement. Br J Anaesth. 2021;126(4):774-90.
- 2. McGlothlin D, et al. ISHLT consensus statement: Perioperative management of patients with pulmonary hypertension and right heart failure undergoing surgery. J Heart Lung Transplant. 2022 Sep;41(9):1135-1194.

3. Patel J, et al. Inhaled versus intravenous milrinone in mitral stenosis with pulmonary hypertension. Asian Cardiovasc Thorac Ann. 2020:0(0):1-9.

Learning points: In patients with severe pulmonary hypertension undergoing non-cardiac surgery inhaled milrinone before anesthetic induction appears to be effective as a selective pulmonary vasodilator, improving right ventricular function.

33AP05-3

Iron status and the risk of idiopathic pulmonary fibrosis: a mendelian randomization study

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Background and Goal of Study: Idiopathic pulmonary fibrosis (IPF) is a fatal lung disease with unknown etiology. Both preclinical researches and clinical samples have shown an association of iron accumulation with a higher risk of IPF and a decline in lung function. Iron status might be a novel target for IPF therapy if a causal relationship exists. Using mendelian randomization, we investigated the putative causal role for iron status in IPF.

Materials and Methods: Single nucleotide polymorphisms (SNPs) for iron status were identified from a genome-wide association study (GWAS) on 48,972 individuals. The outcome data came from the IPF GWAS (1369 cases: 435866 controls) in UK Biobank. We conducted liberal analyses (using SNPs associated with at least one of the biomarkers of iron status) and conservative analyses (using SNPs with concordant change of biomarkers of iron status), with inverse variance weighted (IVW) method as the main analysis.

We then performed sensitivity analyses including weighted median, MR-Egger and MR-pleiotropy residual sum and outlier, as well as leave-one-out analysis to detect pleiotropy.

Results and Discussion: In the liberal analyses, IPF was associated with lower log-transformed ferritin using IVW method (odds ratio [OR] = 0.998, 95% confidence interval [95% CI] = 0.997 -0.999, p = 0.030).

There were no evidence of a link between iron, transferrin, transferrin saturation and the risk of IPF. In the conservative analyses, we found no evidence of association between four biomarkers of iron status and IPF using IVW method with OR 0.999 (95% CI: 0.998 - 1.001) per standard deviation increase in iron, 0.999 (95% CI: 0.996 - 1.002) in ferritin, 1.000 (95% CI: 0.999 - 1.002) in transferrin , and 1.000 (95% CI: 0.999 - 1.001) in transferrin saturation. Sensitivity analyses suggested no pleiotropy detected (all p > 0.05).

Conclusion(s): We provided potential genetic evidences for the causal associations of lower ferritin with increased incidence of IPF. However, the clinical implications of this finding warrant further investigation.

33AP05-4

Pulmonary edema in a healthy orthopedic patient: differential diagnoses

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Background: Naloxone-induced pulmonary edema (PE) is a rare post-operative pulmonary complication, with an unclear mechanism. Negative pressure PE is more common, caused by acute negative intrathoracic pressure generated by spontaneous respiratory efforts against an obstructed airway.

Case Report: A 26-year-old healthy boy was submitted to humeral surgery under general anesthesia, which ran uneventfully and lasted 1 hour. The analgesic regimen included 250 mcg of fentanyl. After surgery, the patient was admitted in the post anesthetic care unit (PACU), where he presented obtunded, hypopneic, with miotic pupils, but hemodynamically stable. We suspected opioid intoxication and administered a bolus of 0,4 mg of naloxone, beside supportive measures.

As a result, he totally recovered consciousness and refered severe pain, for which an ultrasound-guided infraclavicular block was performed. However, the patient remained hypoxemic and developed a hemoptysis-associated cough, with an increase in respiratory rate. The ABG showed type 1 respiratory failure and, to confirm the diagnosis, an angio-CT was done.

The echocardiogram was normal. Assuming ARDS due to a noncardiogenic PE, the treatment included oxygen therapy, noninvasive ventilation and self-prone with progressive fast clinical improvement. The patient was discharged 3 days after surgery, fully recovered.

Discussion: We present a case of postoperative PE of unknow origin following naloxone administration to reverse fentanylinduced respiratory depression. Differential diagnosis included negative pressure PE and PE associated with naloxone.

Naloxone-induced PE is thought to involve an adrenergic crisis triggered by high-dose or rapid administration, although it has also been reported with low doses. This leads to excessive catecholamine release, causing pulmonary vasoconstriction and shift of fluids to the third space.

Alternatively, upper airway obstruction may cause negative pressure PE. Although no laryngospasm was documented and the ventilation was supported at the time of fentanyl-induced respiratory depression, it cannot be excluded.

Learning points: While the cause of this patient's PE may remain uncertain, it may have been exacerbated by elevated vasomotor tone due to pain.

In addition to effective pain management with opioid-sparing techniques, we suggest fractionated administration of naloxone, using the lowest effective dose to elicit the desired response.

33AP05-5

Evaluation of the effect of different FIO2 values on perioperative atelectasia with lung ultrasonography in laparoscopic cholecystectomy operations

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Background and Goal of Study: The main purpose of this study is to use lung ultrasonography to evaluate and ascertain the impact of variations in inspired oxygen fractions (FiO_o) in anesthetic management during laparoscopic cholecystectomy cases on perioperative atelectasis.

Secondary purpose is to monitor and determine how postoperative pulmonary complications (PPC) and hospital stay duration are affected by variations in inspired oxygen fractions (FiO₂).

Materials and Methods: Patients who underwent elective laparoscopic cholecystectomy, aged 18-80, with ASA physical status I-III was included. Patients were classified into two groups: Group D and Group Y based on the applied FiO2. The target SpO2 value in all patients was determined to be 94%; FiO₂ in anesthesia induction as D group 0.7 - Y group 1.0, intraoperative period as D group 0.3 - Y group 0.6, wake-up phase as D group 0.7 - Y group 1.0, and PACU as D group 2 - Y group 10 liters/minute oxygen via oronasal mask implemented with support.

Patients were evaluated using the Modified Lung Ultrasonography Score (MLUS) at two distinct times: 15 minutes before the procedure in the preoperative evaluation unit and 30 minutes after the operation in the PACU.

Results and Discussion: The postoperative MLUS score demonstrated a statistically significant increase in the high FiO_a group compared to the low FiO₂ group (p = 0.034). It was established that the postoperative MLUS score exhibited a statistically significant augmentation relative to the preoperative baseline in both groups (p<0.001).

Additionally, there were no statistically significant difference between the groups regarding intraoperative hypoxemia, postoperative pulmonary complication (PPC) incidence, and discharge duration.

Conclusion(s): This study demonstrated that high FiO, usage leads to a higher incidence of atelectasis compared to low FiO₂ usage according to the Modified Lung Ultrasound Score. Alveolar denitrogenation with oxygen promotes oxygen absorption at lectasis.

33AP05-6 Lung ultrasound in patients after lung transplantation

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Background and Goal of Study: Lung transplantation is the only treatment for the terminal stage of lung diseases. In the early postoperative period, an important task is monitoring the condition of the lung graft. Ultrasound imaging has several advantages over other instrumental diagnostic methods for the early detection of postoperative complications associated with graft dysfunction.

Our aim was to evaluate the feasibility of using ultrasound to examine lung grafts in the early postoperative period for diagnosing pulmonary complications in patients after lung transplantation.

Materials and Methods: As part of a prospective study, 32 lung ultrasounds were performed on 7 patients after lung transplantation. Sonography was conducted using a four-point protocol on the first and third postoperative days. The results of ultrasound examination were compared with the patient's fluid balance, oxygenation and ventilation parameters, and chest CT scans.

Results and Discussion: A statistically significant correlation was identified between the number of B-lines and the fluid balance (r=0.71; p<0.001), between PEEP levels and B-lines (r=0.88; p<0.001), and between B-lines and FiO2 levels (r=0.79; p<0.001). The median number of B-lines observed on the first postoperative day was 4.63, with 100% of patients having a positive fluid balance. On the third postoperative day, the median number of B-lines was 2.0, and 63% of patients had a negative fluid bal-

Additionally, in patients with signs of lung graft dysfunction, ultrasound revealed varying degrees of atelectasis, subpleural consolidations, and pleural effusions, which allowed for rapid optimization of intensive care tactics and increased treatment efficacy.

Conclusion(s): Ultrasound findings in the diagnosis of lung grafts show a significant correlation with PEEP, FiO2, and fluid balance indicators. Ultrasound of lung grafts is an accurate (AUC=0.9±0.05 with 95% CI [0.72-1.0]; p<0.004), non-invasive, safe, and accessible method for assessing extrapulmonary fluid, atelectasis, pleural effusions, and consolidations. Sonography can be utilized for the rapid ultrasound diagnosis of pathological processes in lung grafts.

33AP05-7

Association between postoperative oxygen saturation within the first 2 days postoperative and the incidence of surgical site infection: Post-hoc analysis of 3 randomized trials

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Background and Goal of Study: Surgical site infections (SSIs) are the most common hospital-acquired infections among surgical inpatients, increasing morbi-mortality. Oxygen saturation and perioperative oxygen therapy have been identified as potential preventive measures for reducing SSI rates.

We aim to assess whether minimum postoperative oxygen saturation during the first 48 hours is associated with the incidence of a composite of SSIs within 30 postoperative days.

Materials and Methods: This post-hoc retrospective study analysed data from three randomized clinical trials: iPROVE, iPRO-VEO2, and iPROVE-OLV. The main outcome was a composite measure of SSIs, including superficial, deep, or organ infections, septic shock, and anastomotic leaks within 30 postoperative days. The exposure was the lower postoperative oxygen saturation during postoperative days 1 and 2 while in the surgical ward, and the critical oxygen saturation (SpO₂<92%). Statistical analysis included U-Mann-Whitney and chi-squared tests. Data was analysed using SPSS.

Results and Discussion: Demographics and main outcomes are shown in Table 1. Of 1,456 patients, 257 suffered SSIs. Surgeries included mostly thoracic patients (36%), followed by GI-colorrectal (20%) and GI-non colorectal (20%). Lower oxygen saturation during the second postoperative day was significantly associated with SSIs (P<0.05). Moreover, a critical SpO₂ <92% on postoperative day 2 (POD2) was more prevalent in the SSI group (P<0.01) (Table 1).

	SSi (n=257)	Non-SSi (n=1199)	P value
Age, y.o	66 ± 12	63 ± 14	NS
BMI, Kg/m ²	27 ± 4	26 ± 4	NS
Active smoker n, (%)	31 (12)	607 (19)	NS
SpO ₂ POD1, %	96.6± 2.6	96.8 ± 2.4	NS
SpO ₂ POD2, %	95.8 ± 2.9	96.4 ± 2.4	P<0.05
Critical O, SpO, n, (%)	36 (14%)	98 (8%)	P<0.001

Table 1. Demographics and main outcomes

Conclusion: The lowest oxygen saturation values during the second postoperative day and an increased rate of critical SpO₂ <92% are associated with an increased incidence of surgical site infection. Future studies for the optimization oxygen saturation during the first two postoperative days to reduce SSI rates and improve patient outcomes are needed.

33AP05-8 How hard is to ventilate a miner, lesson learned: case report

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Background: Interstitial lung fibrosis represents a condition highly demanding for perioperative and postoperative anesthetic management. Little is known about the best ventilatory strategy and its impact on mechanics of breathing.

Case Report: A 35 years old male patient was admitted due to intraventricular tumor for elective surgical removal. His history revealed PCA stenting, hypertension, smoking and BMI 36,7.

Next day, after placing a routine monitoring, he was induced in general anesthesia. After an uneventful intubation, there was difficulty for mechanical ventilation with high pulmonary pressures and low compliance.

Therapy with corticosteroids, aminophylline, MgSO4, spray salbutamol and deepening of anesthesia didn't improve his condition. Due to consequential risk of increased intracranial pressure and bleeding, it was decided to awake him and postpone the surgery. After extubation, his saturation improved from 85 to 95%. He revealed information previously not known, that he worked in a mine for 8 years. His auscultation before surgery showed weakened vesicular sounds and unremarkable chest X-ray.

After pulmonology consultation, lung diffusion test (DLCO) showed reduced diffusion and spirometry in favor of restrictive lung disease. He was prescribed corticosteroids and operated few weeks later. He could have been ventilated only with pressure control ventilation with stable surgical course and recovery.

Discussion: Lung fibrosis represents a great perioperative risk especially when it is accompanied with decreased vital capacity, high BMI, smoking, heart disease and occupational hazard1. Pulmonary prehabilitation measures optimize the patient for anesthesia. When it is possible, regional anesthesia is preferred, but when general is the only option restrictive fluid strategy and pressure controlled ventilation are facilitating perioperative management.

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2. Marchioni A, Tonelli R et al. Ventilatory support and mechanical properties of the fibrotic lung acting as a "squishy ball". Ann Intensive Care. 2020 Feb 4;10(1):13. doi:10.1186/ s13613-020-0632-6.

Learning points: Allowing high PEEP and and exposing the lung of high pressures brings a risk of injury by so called forming of "squishy ball" lung areas with devastating effects2.

33AP05-9

Laryngeal mask airway: not immune to laryngospasm-induced negative pressure pulmonary edema

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Background: Postextubation negative pressure pulmonary edema (NPPE) results from upper airway obstruction and, although uncommon, it is a well-known potential complication of anesthe-

Usually, it is associated with endotracheal intubation and mechanical ventilation, but there are some reports showing that it can develop after laryngeal mask (LM) use2.

This case report underlines NPPE after LM use in a young and healthy patient.

Case Report: A 20-year-old male, ASA I, underwent bilateral inguinal hernioplasty under spinal anesthesia. Conversion to general anesthesia with an I-gel LM was performed due to patient agitation.

At the end of the surgery, after LM removal, inspiratory stridor and oxygen desaturation (SpO2 78%) were noted. Immediate measures included ventilation with face mask delivering 100% oxygen and positive pressure, resulting in clinical and oxygenation recovery (SpO2 97%).

In the post-anesthesia care unit, hypoxemia (SpO2 90-92%), persistent cough, pulmonary crackles and a PaO2 of 54 mmHg developed. NPPE was suspected and treatment with morphine, furosemide and oxygen via face mask (6-8 L/min) was initiated. A chest X-ray revealed bilateral interstitial infiltrates.

After 24 hours monitoring in the ICU, he was discharged home with complete resolution of radiological alterations and symp-

Discussion: NPPE results from forceful inspiratory efforts against airway obstruction, which increase pulmonary capillary pressure and fluid transudation into alveoli1.

Although rare with LM use, the development of NPPE should always be kept in mind, especially following airway obstruction events, most frequently laryngospasm. Chest X-ray plays a key role in confirming the diagnosis and guiding treatment1.

References:

- 1. Ma J, et al. Negative pressure pulmonary edema. Exp Ther Med. 2023;26:455.
- 2. Vandse R, et al. Pulmonary edema with laryngeal mask. Int J Crit IIIn Inj Sci. 2012;2:98-103.
- 3. Moreira BL, et al. Acute dyspnea: negative pressure edema. J Bras Pneumol. 2022;48:e20220294.

Learning points: This case demonstrates that rapid recovery is possible with a quick diagnosis and intervention, including oxygen therapy, noninvasive ventilation and fluid management.

Young, healthy male patients are at risk for NPPE, due to their greater muscle mass that can produce high negative intrapleural pressures3.

33AP05-10

Loss of pleural fluid around the lungs during positive pressure ventilation

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Background and Goal of Study: Lungs, filled with air to FRC level, will float on water, the specific gravity of the lung being 0.3 and that of water (or pleural fluid) 1 g/cm3.

Materials and Methods: According to Casha the equilibrium between capillary forces and negative pleural pressure manages to maintain a thin layer of pleural fluid around the lung.

The relation between force F and thickness d of the layer, due to the surface tension γ , is determined by Jurin's law: F = $2.y.A.\cos(\alpha)/d$, here α = is the angle between the surfaces and gravity. Or $d = 2.\gamma . cos(\alpha)/P$ because force F over surface area Aequals pressure P, here pleural pressure. So there is an inverse relation between thickness and local pressure.

Moreover, a fluid layer is only sustainable when pleural pressure is negative. Casha calculated the thickness of pleural fluid layer to range from 20 µ (corresponding to a pleural pressure of about -10 cmH₂O) to about 200 μ (at a pressure of -1 cmH₂O) from the apex to the base of the lung.

Results and Discussion: During natural breathing the pleural pressure varies from about -6 to -10 cmH₂O, with lower pressures being observed during deep sighs or strenuous activities. Negative pressure ventilation replicates these negative pleural pressures while positive pressure ventilation has the opposite effect. In healthy individuals, the compliances of the thoracic wall and lungs are approximately equal.

This means that an increase in airway pressure by 2 cmH₂O typically raises pleural pressure by about 1 cmH_aO. For example, in a theoretical patient with pleural pressure of -10 cmH₂O at the lung apex and -1 cmH₂O at the base (with individual variation), an airway pressure of 2 cmH₂O will neutralize the pleural pressure at the base.

Further increases in airway pressure progressively eliminate negative pleural pressure at higher lung levels.

Conclusion(s): In ARDS patients[i], pleural pressures as high as +15 cmH₂O or more have been reported during mechanical ventilation, indicating that the entire lung is subjected to positive pressure. This disrupts the pleural fluid layer, leading to its disappearance[iii].

Consequently, the visceral and parietal pleurae, both covered with microvilli, are pressed directly against each other, impairing lubrication and disrupting homeostasis[i].

References:

- i. Casha AR et al. J Thorac Dis 2017;9:979-89.
- ii. Talmor D et al. N Engl J Med 2008;359:2095-104.
- iii. Van Egmond J et al. J Thorac Dis 2024;16:8103-9.

33AP05-11

Exploring rare terrain: Laparoscopic rectal surgery in a patient with Birt-Hogg-Dubé syndrome

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Background: Birt-Hogg-Dubé syndrome (BHDS) is a rare autosomal dominant disorder characterized by fibrofolliculomas, pulmonary cysts, and renal neoplasms. It results from mutations in the FLCN gene, which encodes folliculin.

Patients with BHDS require individualized perioperative management due to risks such as pneumothorax and renal dysfunction. Surgical interventions involving general anesthesia in BHDS are infrequently reported.

Case Report: A 71-year-old male with BHDS underwent anterior rectal resection via a laparoscopic approach under general anesthesia. His history included multiple pulmonary cysts without prior pneumothorax.

Anesthetic management prioritized minimizing barotrauma by employing lung-protective ventilation strategies. The laparoscopic technique was chosen for its minimally invasive nature, to reduce stress on pulmonary and renal systems.

The procedure was uneventful, with stable hemodynamics. Postoperative recovery was smooth, with no respiratory or renal complications, and the patient was discharged on postoperative day

Discussion: BHDS poses unique perioperative challenges due to multi-system involvement. Pulmonary cysts elevate the risk of barotrauma and pneumothorax, especially under positive-pressure ventilation. Renal dysfunction necessitates careful evaluation of nephrotoxic drugs.

In this case, multidisciplinary planning and a minimally invasive surgical approach facilitated a favorable outcome. The patient's smooth recovery underscores the importance of tailored perioperative strategies for rare syndromes like BHDS.

References:

1. Miranda C: Birt-Hogg-Dubé syndrome: a rare cause of pneumothorax complicating general anaesthesia. Wiley. 2. Crane JS, Rutt V, Oakley AM: Birt-Hogg-Dube Syndrome. StatPearls Publishing. Published Online First: 5 December 2024. 3. Oliveira RC, Tavares E, Sousa V, et alBirt-Hogg-Dubé syndrome: awareness is important! Case Reports 2017;2017:bcr-2017-221022.

Learning points:

- 1. Comprehensive preoperative evaluation is critical to address risks associated with pulmonary and renal manifestations of **BHDS**
- 2. Multidisciplinary planning and personalized anesthetic techniques, including lung-protective strategies, are essential.
- 3. Minimally invasive approaches reduce perioperative morbidity and enhance recovery in BHDS patients.

33AP06-2

Helmet continuous positive airway pressure (hCPAP) in patients with acute respiratory failure prospective observational study with modified helmet

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Background and Goal of Study: The use of oxygen therapy and continuous positive airway pressure (CPAP) reduces the percentage of patients who will require mechanical ventilation due to respiratory failure in pulmonary edema, COPD, ARDS or COVID-19. Long-term use of standard masks for CPAP is limited by their intolerance. The use of a helmets allows to effectively maintain CPAP for up to few weeks, but the risk of CO₂ accumulation necessitates a high flow of gases (40-60I/min), increasing oxygen consumption and patient discomfort.

The aim of the study was to evaluate the efficacy, safety and tolerability of modified helmet for oxygen therapy in patients with acute hypoxemic respiratory failure.

Materials and Methods: Prospective observational study. A total of 80 patients with respiratory failure due to postoperative atelectasis, pulmonary edema or pneumonia with an oxygenation index of 150-250 and/or SpO₃<92% despite passive oxygen therapy were enrolled. Based on the results of computed simulation tests. test-stand measurements and tests on 40 healthy volunteers. the helmet was modified by changing the place of gas outlet to the central and limiting the gas flow to 30 I/min. Four methods of generating gas flow were used (gas regulators, gas mixer, CPAP machine and ventilator). Oxygen therapy was carried out in accordance with the ARDS Network scheme.

Patients vitals parameters were monitored with transcutaneous pCO₂ in addition. In-helmet CO₂ concentration, humidity and temperature were measured. Patients also rated the perceived noise, dryness and warmth.

Results and Discussion: After 60 minutes of hCPAP, 69% of patients had improved oxygenation parameters allowing for stay on passive oxygen therapy only, 21% improved but required continuation of CPAP, and 10% discontinued the helmet use at request.

The analysis of variance did not show significant differences for the selected method of generating gas flow. The CO2 concentrations in the helmet did not change significantly with an average value of <1%. The average assessment of the patient's noise perception remained low. No significant hypercapnia was reported in percutaneous measurements. No critical events occurred.

Conclusion: Modification of the position of the gas outlet allows for effective oxygen therapy with helmet CPAP in patients with respiratory failure with limited gas flow.

Researchgrant: The National Centre for Research and Development (NCBR) - SZPITALE-JEDNOIMIENNE/52/2020helmet

33AP06-3

Severe respiratory failure in severe pneumococcal pneumonia: The role of differential lung ventilation and venovenous extracorporeal membrane oxygenation. A case report

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Background: Pneumococcal pneumonia is a common but potentially severe disease. Both double-lumen tubes (DLT) for differential lung ventilation (VPD) and venovenous extracorporeal membrane oxygenation (VV ECMO) have been described in the literature as potential options in severe cases.

We present the case of a patient with tension pneumothorax and pneumococcal pneumonia who required both devices for management.

Case Report: A 41-year-old male with right tension pneumothorax and sepsis (pneumococcal origin) required pleural drainage and was admitted to the ICU. After 16 hours, his condition worsened, leading to respiratory failure, necessitating intubation. Despite mechanical ventilation, oxygenation failed, so a left DLT was placed, and VPD was initiated with two unsynchronized ventilators, improving oxygenation. Once stabilized with a P/F ratio <100, VV ECMO was started. A new pleural drain was placed.

After 24 hours, the DLT was replaced with a conventional endotracheal tube, and protective ventilation with high FiO2 was started. Severe sepsis and renal failure were treated with vasopressors and hemodiafiltration. As lung re-expansion progressed, FiO2 levels were gradually reduced, and ECMO was removed on day 13, with successful extubation to high-flow oxygen therapy two days later.

Discussion: Differential lung ventilation and venovenous extracorporeal membrane oxygenation are essential tools in managing severe respiratory failure. VPD stands out as an effective bridge to ECMO in cases of severe intrapulmonary shunt, allowing for oxygenation optimization before initiating extracorporeal support. Additionally, in resource-limited settings or when ECMO is not a viable option, VPD provides a cost-effective and accessible alternative using standard intensive care equipment.

Combined, as demonstrated in the presented case, these strategies are not mutually exclusive but complementary, enabling patient stabilization during critical stages and promoting recovery.

References:

Creech K T, Chaudhry U (May 20, 2021) One-Lung Ventilation in a Patient With Necrotizing Pneumonia Complicated by a Bronchopleural Fistula. DOI 10.7759/cureus.15138

Learning points:

Consider VPD in cases of severe shunt or refractory respiratory failure as a bridge to ECMO.

Understand VPD as an effective, more accessible, and cost-effective option in certain cases.

Consider VPD in severe shunt or respiratory failure cases that are not candidates for VV ECMO.

33AP06-4

Invasive pulmonary aspergillosis in previously healthy 48-year-old women

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Invasive Pulmonary Aspergillosis (IPA) is a common but underappreciated cause of death among patients in Intensive Care Unit (ICU). It occurs in 2.8% of this population with mortality ranging up to 90%.

Case: A 48-year-old female was admitted to Intensive Care Unit (ICU) due to unexplained respiratory failure. For three weeks she was treated with beta-lactams, macrolides and fluoroquinolones for pneumonia symptoms. Vital signs in the ICU were: blood pressure 100/50 mmHg, heart rate 120/min, temperature 37° C, respiratory rate (RR) 50/min and arterial oxygen saturation 63%. Performed chest X-ray revealed diffused bilateral opacities and patient met criteria for severe Acute Respiratory Distress Sydrome. She was intubated and ventilated in pressure-regulated volume control mode with 60% of oxygen.

We initiated prone positioning, neuromuscular blockade and broadened pharmacotherapy with Voriconazole and Methyloprednizolone. All microbiological cultures, bronchoaspirate and serum for ELISA-based Aspergillosis revealed negative results. Second day, due to critical respiratory failure and lack of improvement after ventilatory manouvers, we started Veno-Venous Extracorporeal-Membrane-Oxygenation (ECMO). Mechanical ventilation with DuoLevel mode: P $_{\rm low}$ 13 cm H2O and P $_{\rm high}$ 28 cm H2O was applied and the static compliance was 16 ml/cm H₂O.

During ICU-stay the woman's general state remained critical, chest X-ray's progressed to total bilateral opacities and patient became fully ECMO-dependent. Woman died 11 days after ICU admission and 9 days after ECMO initiation. While cause of death initially remained unclear, the postmortem examination revealed the presence of IPA.

IPA affects not only immunocompromised patients and it is imperative to standardize management for non-neutropenic ICU population. Diagnosis might be challenging as radiological features such as "halo" or air crescent sign are rarely described and non-culture-based tests seems to have low diagnostic value. Even though obtaining histological tissue may not be feasible, it still remains a golden standard for proven diagnosis [1]

Referencs:

1. Bassetti, M. et al. Invasive Fungal Diseases in Adult Patients in Intensive Care Unit (FUNDICU): 2024 consensus definitions from ESGCIP, EFISG, ESICM, ECMM, MSGERC, ISAC, and ISHAM.

Learning points:There is an emerging need for further research concerning IPA diagnosis criteria. Early initiation of antifungal therapy is crucial for limiting mortality in ICU patients.

33AP06-5

Heart-lung interactions to predict hemodynamic tolerance to the Open Lung Approach

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Background: The open lung approach (OLA) uses recruitment maneuvers (RMs) to increase intrathoracic pressure and adjust individualized PEEP, which may reduce venous return. Heart-lung interaction (HLI) parameters, like pulse pressure variation (PPV) and tidal volume challenge (TVC), predict fluid responsiveness by assessing hemodynamic changes with lung volume variations. We hypothesize that HLI parameters may also predict hemodynamic response to OLA.

The main goal is to determine if HLI parameters (TVC and PPV), measured pre-RM, predict a ≥10% cardiac index (CI) decrease 5 minutes post-RM.

Further, we aimed to assess if CI changes correlate with mean arterial pressure (MAP), evaluating MAP's reliability in reflecting hemodynamic impact.

Methods: This prospective study includes adult surgical patients with normal cardiopulmonary function on invasive ventilation and hemodynamic monitoring. Eligible patients show adequate arterial waveform for pulse contour analysis (MostCare®) and potential RM benefit (positive air-test or clinical condition).

Exclusion criteria: pneumoperitoneum, open chest, or RM contraindications. HLI and hemodynamic parameters were measured pre- and post-RM. Patients were classified as TVC-positive (PPV increase ≥3) or TVC-negative.

Sample size calculated as 72. Logistic regression used PPV at 6 and 8 mL/kg Tv (PPV_g, PPV_g) and TVC as predictors, with ≥10% CI decrease as the binary outcome. Model performance assessed by sensitivity, specificity, predictive values, and AUROC. Pearson correlation evaluated CI-MAP relationships.

Results: Preliminary data from 33 patients (15 TVC + and 18 TVC -) show TVC significantly predicts a ≥10% CI decrease, with a coefficient of 0.68 (p<0.01) and an AUC of 0.85. PPV_8 and PPV_6 showed moderate and mild discrimination (AUC 0.75 and 0.64). No significant CI-MAP correlation was found pre- and post-OLA. Initial findings suggest HLI parameters may predict hemodynamic tolerance to OLA.

Thus, HLI-guided optimization may prevent CI decrease, as MAP alone cannot fully assess this hemodynamic impact.

Conclusions: Preliminary results indicate HLI parameters may enhance hemodynamic management during OLA.

ESAIC_MSP_2023_JJ.

33AP06-6

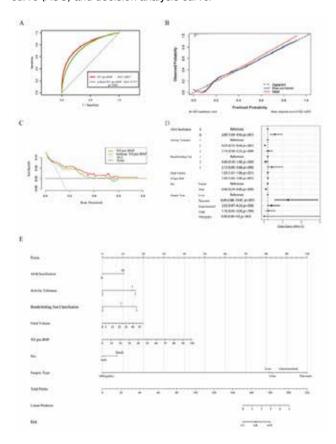
Predictive value of perioperative amino-terminal brain natriuretic peptide for postoperative pulmonary complications in elderly patients undergoing non-cardiac surgery

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Background and Goal of Study: To assess the predictive value of preoperative amino-terminal brain natriuretic peptide (NTpro BNP) for postoperative pulmonary complications (PPCs) in elderly patients.

Materials and Methods: Data were prospectively collected from 174 elderly patients undergoing non-cardiac surgery, and NT-pro BNP levels were measured 2 hours before surgery. Full subset regression was used for variable screening, and multivariable logistic regression was used to construct the model.

The predictive value of preoperative NT-pro BNP for PPCs was evaluated by area under the receiver operating characteristic curve (AUC) and decision analysis curve.



Results and Discussion: PPCs occurred in a total of 22 patients (12.64%). Full subset regression analyses were performed to screen the final variables, which were ultimately included in the multivariable logistic regression model as gender (OR=0.48, 95% Cl: 0.29-0.80), ASA classification (OR=2.89, 95% Cl: 1.69-4.94), activity tolerance (grade 2: OR=0.23, 95% CI: 0.12-0.44 OR=1.14. 95% CI: 0.58-2.23), breath-holding test classification (grade 2: OR=0.40, 95% CI: 0.16-1.00; grade 3: OR=2.13, 95% CI: 0.89-5.08), total fluid volume (OR=1.03, 95% CI: 1.01-1.06), type of surgery (pancreatic surgery) OR=6.44, 95% CI: 2.88-14.41; gastrointestinal surgery: OR=2.03, 95% CI: 0.97-4.24) and preoperative NT-pro BNP (OR=1.05, 95% CI: 1.03-1.06).

The preoperative NT-pro BNP increased the AUC of the multivariable logistic regression model from 0.777 to 0.815, a statistically significant difference (p<0.05). The results of the decision analysis curves showed a net clinical benefit from the multivariable Logistics regression model after the addition of preoperative NT-pro BNP at all risk decision thresholds.

Conclusion(s): The limited data available suggests that preoperative NT-pro BNP is an independent predictor of PPCs in elderly patients with non-cardiac surgery, which can significantly improve the predictive performance of the model and obtain a net clinical benefit, enabling early and accurate prediction and risk stratification of PPCs.

33AP06-7

The impact of different postoperative sedation strategies on the duration of mechanical ventilation after coronary artery bypass graft surgery: a retrospective observational study

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Background and Goal of Study: Mechanical ventilation (MV) is an indispensable part of the postoperative course after coronary artery bypass graft surgery. The aim of this study was to compare the length of MV in patients sedated with continuous infusion of propofol compared to those sedated with bolus doses of midazolam.

Materials and Methods: The research was conducted as a retrospective observational study at the Institute of Cardiovascular Diseases of Vojvodina in Sremska Kamenica (Serbia). The study included two groups of patients who underwent elective coronary artery bypass graft surgery. The Group P consists of patients operated on in the period from January 1, 2023, and October 31, 2023, who were postoperatively sedated with continuous infusion of propofol. The Group M consists of patients operated on between January 1, 2019, and October 31, 2019, who were sedated with bolus doses of midazolam.

Results and Discussion: A total of 915 patients were included in the study (481 patients in group P and 434 patients in group M). The groups did not differ in demographic and anthropometric characteristics. All comorbidities were equally represented except for chronic obstructive pulmonary disease and smoking, which were more common in the group P. The length of postoperative MV was significantly shorter in patients from group P (8.2h vs. 13.7h, p = 0.000). In the same group, the length of hospitalization (in days) was also shorter (7.3 vs. 9.1, p = 0.000). Group P had significantly more pleural effusions as a complica-

tion (p = 0.004), while group M had more respiratory failure (p = 0.022). Other postoperative pulmonary complications (atelectasis, pneumothorax, pneumonia, and reintubation) were equally prevalent.

Conclusion(s): Continuous sedation with propofol after coronary artery bypass graft surgery leads to shorter mechanical ventilation and shorter hospitalization, compared to intermittent administration of midazolam.

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Zdravković R, Tatić M, Golubović M, et al. Effects of mechanical ventilation during cardiopulmonary bypass on postoperative pulmonary complications. Medicinski Pregled. 2023;76:10-5. Preveden M, Zdravković R, Vicković S, et al. Dexmedetomidine vs. propofol sedation reduces the duration of mechanical ventilation after cardiac surgery - a randomized controlled trial. Eur Rev Med Pharmacol Sci. 2023;27:7644-52.

33AP06-8

Prevalence, outcome and health care costs of postoperative ARDS compared to medical ARDS

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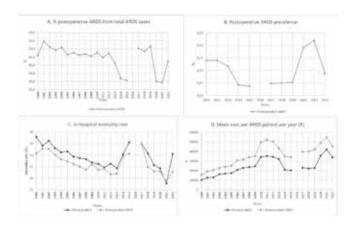
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Background and Goal of Study: Postoperative acute respiratory distress syndrome (ARDS) is a critical post-surgical complication with a reported prevalence of up to 20% and a mortality rate of up to 80%. Little has been published comparing postoperative ARDS with medical ARDS, showing postoperative ARDS lower mortality. We aimed to evaluate the prevalence, hospital mortality, and associated healthcare costs of postoperative ARDS in Spain from 2000 to 2022 and compare them with those of patients who developed ARDS from medical conditions.

Materials and Methods: We performed a nationwide, registrybased study of all hospitalizations for postoperative ARDS in Spanish hospitals from January 1, 2000, to December 31, 2022, using the Minimum Basic Data Set (MBDS) registry. We analyzed the prevalence, hospital mortality, and average health-care cost for postoperative and medical ARDS.

Results and Discussion: We identified a total of 93,192 ARDS patients of which 40.601 had post-operative ARDS. Postoperative ARDS prevalence varied between 0.05-0.22%, accounting for 45-50% of total ARDS cases. Hospital mortality was lower in postoperative ARDS compared with medical ARDS during the first phase (2000-2015) of the study (47.0% vs. 49.9%, p<0.001), converging during the second phase (2017-2022). In both cases, mortality declined throughout the study period, probably due to improvements in perioperative management and ARDS treatment.

Costs for postoperative ARDS were 1.5 times higher than medical ARDS, linked to 1.5 times longer hospital stay, a well-known driver of increased healthcare costs. ECMO use increased in both groups during the study period, accompanied by a decline in hospital mortality. However, the reduction in mortality was more pronounced in medical ARDS patients, suggesting that ECMO may be less effective in reducing mortality for postoperative ARDS patients.



Conclusions: This is the largest study on postoperative ARDS. The prevalence of postoperative ARDS has remained stable, except during the COVID-19 pandemic, and its hospital mortality has equalized that of medical ARDS. However, the costs associated with postoperative ARDS remain significantly higher.

33AP06-10

Aneurysmal subarachnoid hemorrhage complicated with iatrogenic pneumothorax and neurogenic pulmonary edema - a case report

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Background: One of the life-threatening complication of aneurysmal subarachnoid hemorrhage (aSAH) is neurogenic pulmonary edema (NPE). NPE has a high in-hospital mortality in patients with aSAH, especially if it is complicated with iatrogenic pneumo-

Case Report: A 50-year-old female patient was admitted to our hospital after rupture of basilar artery. On the next day after admission, embolization of bleeding artery was done in general anesthesia. Mechanical ventilation, continuous sedation with Midazolam and vasoactive therapy with Noradrenalin was continued. On the third day of hospitalization, a central venous catheter was placed through the right subclavian vein. Control chest X-ray verified the development of postprocedural right-sided pneumothorax. Chest tube was urgently placed. Control chest X-ray has shown completely re-expanded lung.

On the eighth day, cardiorespiratory deterioration occurred. Patient was still intubated, but tachypneic, dyspneic, with frothy tracheal aspirate. ECG shown sinus rhythm with bradycardia and negative T-waves in D2, D3, AVF, V2-V6 leads. Troponin T serum level was increased. Chest X-ray has shown bilateral pulmonary infiltrates. Diuretic therapy was immediately forced. Two days after, a decrease in value of cardiac markers was noticed as well as regression of chest X-ray infiltrates.

Twenty days after cardiorespiratory deterioration, patient was weaned from mechanical ventilation and chest tube was removed.

Discussion: aSAH can be complicated with pulmonary complications. NPE is well known and described. latrogenic pneumothorax can additionally deteriorate ventilation and oxygenation. Chest tube placement with supportive therapy and forced digresis are necessary for positive outcome of these patients.

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Learning points: Early recognition of NPE in aSAH patients is necessary because of high in-hospital mortality in patients with aSAH. Pneumothorax can compromise recovery. Careful management of mechanical ventilation is necessary for appropriate blood gas exchange.

33AP06-11

Examination of prognostic factors for severe COVID-19: Importance of arterial blood-end-tidal carbon dioxide partial pressure gradient

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Background: More than four years have passed since the novel coronavirus disease (SARS-Cov-2) was discovered in December 2019 in japan. COVID-19 is still mutating repeatedly. Although the number of severe patients has been reported to decrease with the Omicron varia, a certain number of patients may become severe and require tracheal intubation.

We investigated prognostic predictors for patients with severe coronavirus pneumonia who underwent tracheal intubation at our hospital.

Case Report: A comparison was conducted on clinical backgrounds and the risk of death in relation to the arterial bloodend tidal carbon dioxide partial pressure difference (Pa-ET CO2: ΔCO2) in 20 patients who were diagnosed with novel coronavirus disease and underwent tracheal intubation.

Comparing the prognostic predictors between the survival and death groups, significant differences were observed in ΔCO2(P<0.05). Death was significantly observed in cases in which Δ CO2 deviated by 7.8 or more on the third day.

Discussion: Hypoxemia in severe COVID-19 is said to be due to cytokine storm and micropulmonary embolism. In micropulmonary embolism due to severe COVID-19, alveolar dead space increases, Δ CO2 is significant in the early stage of tracheal intubation. This study suggests that an increase in Δ CO2 may lead to a worse prognosis.

Reference:

Hall V, et al. Protection against SARS-CoV-2 after Covid-19 vaccination and previous infection. N Engl J Med 2022.

Learning points: We analyzed and examined the patient background and changes in ΔCO2 over time for severe COVID-19 from a retrospective perspective. It was suggested that the early changes in $\Delta CO2$ over time may be a predictor of prognosis for severe disease.

33AP07-2

Chronic pain incidence and risk factors after video assisted thoracoscopic surgery: retrospective study

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Background and Goal of Study: Chronic postsurgical pain (CPSP) following video-assisted thoracoscopic surgery (VATS) is a prevalent complication, but its risk factors remain inadequately defined. This study aims to determine the incidence and risk factors for post-thoracotomy pain syndrome (PTPS) after VATS in a tertiary-care setting.

Materials and Methods: This retrospective single-center study included patients who underwent elective VATS at Koc University Hospital between January 2023 and January 2024. Eligible patients were contacted via phone to assess for the presence of pain persisting beyond three months at the surgical site. Univariate and multivariate binary logistic regression models were

Results and Discussion: Of the 328 patients, 195 met the eligibility criteria. Among them, 59 patients (30.3%) reported chronic postsurgical pain (CPSP) three months after VATS. Female patients had a 2.2-fold increased incidence of CPSP compared to males (p<0.05).

used to identify significant risk factors associated with PTPS.

Additionally, postoperative pregabalin use was associated with a higher risk of developing chronic pain compared to non-users (p<0.05). The regression model accounted for 12% of the variation in PTPS occurrence.

Conclusion(s): Female gender and postoperative pregabalin use are significant risk factors for PTPS after VATS. Clinicians should be aware of these risk factors to identify high-risk groups. Early consultation with a pain management specialist should be

considered in patients exhibiting signs of chronic pain after tho-

racic surgery. References:

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Management of pain in severe thoracic trauma: a Retrospective review

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Background and Goal of Study: Severe thoracic trauma, especially involving rib fractures, presents significant challenges in perioperative management.

The goal of this study was to evaluate the management strategies for patients with three or more rib fractures, identify the risk factors associated with complications, and suggest potential areas for improvement in current practices.

Materials and Methods:

- Retrospective descriptive review conducted at our center.
- Data collection period: 1 year.
- Inclusion criteria: Thoracic trauma with ≥3 rib fractures.
- · Data reviewed: Demographics, associated injuries, complications, and mortality.
- · Variables analyzed using SPSS and Excel.

Results and Discussion: The sample showed an average of 5 fractures, with 25% of patients having bilateral fractures. Pain management strategies included: Conventional analgesia (30%): intravenous NSAIDs and paracetamol with subcutaneous morphine as rescue. Elastomeric pump (20%): tramadol and dexketoprofen or metamizole. PCA pump (25%): morphine. Epidural morphine (25%).

58% of patients required critical care unit admission. Mortality was 5.4%. Statistically significant factors (p<0.05) associated with mortality included conventional analgesia (correlation [Cor] 0.29) and traumatic brain injury (TBI) related to rib fractures (Cor

Complications occurred in 26%, including pneumonia, pulmonary embolism, acute respiratory failure, arrhythmia, bacteremia, and mechanical ventilation. Significant factors associated with complications were the number of fractures, bilateral fractures (Cor 0.28), conventional analgesia (Cor 0.33), elastomeric analgesia (Cor 0.21), and TBI (Cor 0.37).

Pain assessment was poorly documented; only 14% of records included a Visual Analogue Scale (VAS) score.

Conclusion(s): Complications were significantly associated with the number of rib fractures and bilateral fractures. Severe TBI with thoracic trauma was linked to increased mortality. Mortality (5.4%) was lower than reported in literature (~10%) 1.

The current multidisciplinary protocol for rib fracture management is adequate. Improvement areas would be to better document VAS pain in medical records and implement new analgesic techniques to enhance patient care.

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33AP07-4

Peri-operative analgesia management of cardio-esophagectomy - Single centre clinical

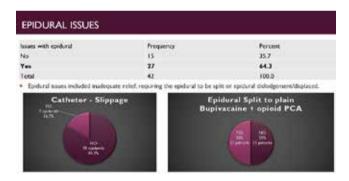
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Background: Thoracotomy incisions in transthoracic esophageal surgeries are among the most painful, highlighting the critical role of effective anesthetic techniques in postoperative pain management. This audit reviewed perioperative analgesia management following cardio-esophagectomy over one year.

Methodology: Data from anesthesia charts, CPET reports, prescription charts, ICU, and pain team documentation were analyzed using SPSS 20.0 and R programming.

Results: The audit included 48 patients (81.3% male, mean age 64.87 years, mean CPET score 11.81). Most patients (64.6%) were ASA class 2. Epidurals were attempted in 44 patients and successfully placed in 42 (87.5%), with 85.7% (36) being tunneled. Six tunneled epidural catheters dislodged, while stitched & tunneled epidurals (11.9%) showed no dislodgements but inadequate relief, necessitating switching to plain bupivacaine epidural & IV opioid. Six patients did not receive epidurals; four received spinal diamorphine (including two failed epidural attempts), while two had paravertebral blocks (PVB), rectus sheath catheters, & opioid PCA. Lidocaine patches were used in 62.5% of patients.

Inferential analysis using the Mann-Whitney U test revealed a significant difference in PCA infusion duration between epidural & non-epidural groups (p = 0.014). No significant relationship was found between epidural issues & vasopressor duration or PCA infusion duration and vasopressor duration.



Discussion: Thoracic epidurals, considered the gold standard, reduce ICU stavs & opioid use but are less effective for esophagectomy patients with abdominal wounds. PVB is a viable alternative when epidurals are contraindicated or challenging to place.

Conclusion: A well-functioning thoracic epidural significantly smoothens the perioperative course, although the success rate is around 50%. Stitching epidurals prevents catheter dislodgement. Continuous monitoring of regional anesthesia is crucial. Further multicenter RCTs and cohort studies are needed to compare thoracic epidurals with other analgesic modalities.

Reference:

Howells P, Bieker M, Yeung J. Oesophageal cancer and the anaesthetist. BJA Education. 2017;17:68-73.

Impact of and individualized open-lung approach and surgical thoracic technique on postoperative pulmonary complications. a sub-analysis of the iPROVE-OLV

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Background and Goal of Study: It is uncertain whether the application of a perioperative open-lung approach (iOLA) ventilation strategy, which includes recruitment maneuvers and an individualized PEEP trial, impacts on respiratory mechanics, gas exchange and postoperative pulmonary complications (PPCs) depending on the surgical technique (open lung resection [thoracotomy] vs Video-assisted thoracoscopy surgery [VATS]).

We aimed to compare ventilator mechanics, oxygenation levels and PPCs in patients ventilated with an iOLA strategy undergoing thoracotomy vs. VATS.

Materials and Methods: Secondary analysis of a randomized, international, multicenter controlled trial enrolling 1.380 patients scheduled for thoracic surgery using OLV1.

We analysed the iOLA group and compared patients submitted to thoracotomy vs. VATS. The main outcome was to analyse ventilatory mechanics, gas exchange and need of rescue maneuvers. To test categorical variables, Chi2test, relative risks (RRs) with 95% confidence intervals (CI) were calculated.

Composite primary-outcome was assessed as total occurrence within the observation window, or as yes/no occurrence. A twosided p<0.05 was considered statistically significant.

Results and Discussion: 670 patients were included in the analysis: 458 in the thoracotomy group and 187 in the VATS group. Baseline characteristics did not differ among groups. There were no differences in thoracotomy vs VATS neither PPCs [RR 0.63] (0.32-1.24)], PEEP values [8.19 (1.99) vs 8.01 (2.19), p=0.368] nor Driving Pressure [11.06 (4.64) vs 11.75 (11.32), p=0.464) or PaO₂/ FiO₂ratio [281.76 (130.95) vs 298.76 (130.95), p=0.139] between groups. Patients that underwent VATS approach needed less intraoperative rescue maneuvers, compared to thoracotomy [21 (5.6) vs 18 (11.6), p=0.025].

Conclusion(s): Patients who undergo thoracic surgery via thoracotomy vs. VATS, managed with a perioperative iOLA ventilation strategy did not show differences in PPCs, PEEP requirements, gas exchange or respiratory mechanics.

Patients treated via VATS needed less intraoperative rescue maneuvers. In conclusion, iOLA management is a safe perioperative strategy that is not affected regardless of the surgical technique. References:

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33AP07-6

Is donor lung preservation at 10°C during ischemic time in lung transplantation a safe alternative? Experience from a tertiary center

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Background and Goal of Study: Preservation at 10°C extended ischemic times beyond the traditional 6-8 hours while maintaining survival rates consistent with the literature. However, ischemic times >14 hours for the first lung and >16 hours for the second were associated with higher PGD and mortality, underscoring the need for defined safety thresholds.

Hypothesis: Preservation at 10°C enables safe extension of ischemic times during lung transplantation without increasing severe postoperative complications, achieving outcomes comparable to 4°C preservation.

Materials and Methods: A descriptive observational study analyzed 47 bilateral lung transplants performed with preservation at 10°C. Lungs were transported on ice and transferred to a 10°C refrigerator upon arrival. Single lung transplants were excluded. Data collected included donor and recipient demographics, ischemic and refrigeration times, and postoperative outcomes: PGD incidence, ECMO requirement, ICU stay, and mortality at 30 and 90 days. Descriptive analysis was performed, presenting quantitative data as means or medians and qualitative data as frequencies or percentages.

Results and Discussion: Mean ischemic times were 13 hours for the first lung and 15 hours for the second. Overall survival was 83%. Ischemic times >14 hours for the first lung were associated with an increase in mortality from 10% to 25% and PGD from 20% to 35%.

For the second lung, ischemic times >16 hours increased mortality from 12% to 30% and PGD from 22% to 55%. Refrigeration times >7 hours (first lung) and >9 hours (second lung) were linked to higher mortality.

Pulmonary perfusion differentials >40% correlated with 44% PGD and 22% mortality. Severe pulmonary hypertension was associated with PGD rates of 67% and mortality of 33%.

Preservation at 10°C extended ischemic times beyond the 6-8 hours traditionally achievable with 4°C, achieving survival rates consistent with existing literature. However, ischemic times >14 hours for the first lung and >16 hours for the second were associated with increased PGD and mortality. These findings highlight the importance of defining safe ischemic thresholds to optimize outcomes.

Conclusion(s): Lung preservation at 10°C extended ischemic times to 13 and 15 hours with a 19% overall mortality. Exceeding 14 and 16 hours increased risks, underscoring the need for safe ischemic limits.

Evaluation of the effectiveness of analgesia provided with the catheterized ESP block in thoracic surgery

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Background and Goal of Study: The sufficient level of analgesia in thoracic surgery is provided with a combination of opioids and regional methods of anesthesia. Thoracic epidural anesthesia (TEA) is considered to be the gold standard but it has a number of limitations due to technical complexity, antiplatelet/anticoagulant therapy, etc. ESP block has recently been considered as a possible alternative to existing regional methods of analgesia in thoracic surgery.

The aim of this study was to compare the catheterized ESP block and TEA in terms of the quality of analgesia in thoracic surgery and the development of side effects.

Materials and Methods: 88 patients with ASA II undergoing lobectomy, bilobectomy, segmentectomy were enrolled. Patients were divided into 2 groups: in Group.1 (Gr.1) TEA (bupivacaine 0.25%) was used, in Group.2 (Gr.2) catheterized ESP-block was used with the administration of bupivacaine 0.25% before the surgery and then every 4-6 hours after the surgery for the next 2 days.

Exclusion criteria were the presence of diabetes mellitus, lung resection in the past, patient refusal. TIVA was provided during surgery both in Gr.1 and Gr.2. NSAIDs, paracetamol, nefopam were routinely used for pain relief in the postoperative period, as well as morphine when needed.

To assess the quality of pain relief in the perioperative period glucose and cortisol levels in the blood were measured while the NRS and total dose of morphine were used to assess the level of pain postoperatively. Hemodynamic parameters during and after surgery, as well as the incidence of postoperative complications. were also evaluated.

Results and Discussion: The quality of postoperative analgesia in patients in Gr.2 (ESP) was comparable to that in Gr.1 (TEA), but patients in Gr. 2 had a greater need for additional opioid analgesia. There was no significant difference in the fluctuations of hemodynamic parameters (mean arterial pressure, heart rate, stroke volume, cardiac index) and the incidence of complications between two groups studied.

Conclusion(s): Catheterized ESP block is a safe method of regional anesthesia that is slightly inferior to TEA. It can be used as an alternative method of regional anesthesia in thoracic surgery to improve the quality of intra- and postoperative analgesia in case when TEA cannot be an option.

33AP07-8

Bronchial injury following double lumen endotracheal tube placement: a case report

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Background: latrogenic Tracheobronchial Injury (ITBI) is an infrequent but severe complication of invasive medical procedures, with significant morbidity and mortality rates. The most common cause of ITBI is orotracheal intubation.(1)

The vast majority of ITBIs manifest with dyspnea, cough, subcutaneous emphysema, pneumomediastinum, unilateral pneumothorax and/or respiratory insufficiency.(2)

Case Report: We present a case of a 75-year-old patient who was hospitalised for elective thoracic surgery. The surgeon verified a 3cm laceration of the left main bronchus intraoperatively, following atraumatic placement of the left double-lumen tube via direct laryngoscopy. Tracheal and bronchial cuff pressures were not measured since the cuff manometer was not available. The laceration was surgically repaired upon completion of planned surgery with a pleural patch.

Discussion: To prevent ITBIs and ensure patient safety, medical professionals performing invasive procedures should thoroughly examine patients before the procedure and minimise possible external factors.

In some cases, like the one here presented, one of the contributing factors can be a lack of equipment. TBI requires early diagnosis and experienced evaluation.

Although surgical repair remains the gold standard of treatment, conservative and interventional treatment should also be considered in every individual patient.(3)

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Learning points: We can not be sure whether an endogenous or exogenous factor directly caused the injury in this case, but we strongly believe that the cuff manometer should be used to maximise patient safety.

Pulmonary complications with titrated versus fixed PEEP in older patients recovering from lung cancer surgery: a randomized trial

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Background and Goal of Study: Titrated intraoperative positive end-expiratory pressure (PEEP) improves respiratory function, but its effect on postoperative pulmonary complications (PPCs) in older lung resection patients remains uncertain.

Materials and Methods: We recruited lung cancer patients aged ≥60 years scheduled for open or video-assisted thoracic surgery using single-lung ventilation (SLV). Patients were randomly assigned to either individualized PEEP (PEEPIND) based on electrical impedance tomography (EIT) or a fixed PEEP of 5 cm H2O (PEEP5). PEEPIND was titrated during single-lung ventilation (SLV) before surgery and double-lung ventilation (DLV) after surgery.

Tidal volume was set to 6 mL/kg of predicted body weight, with respiratory rates set at 12-15 breaths/min, and lung recruitment maneuvers were used.

The primary endpoint was a composite of PPCs. Secondary endpoints included postoperative extra-pulmonary complications, postoperative hospitalization duration, and 30-day readmission

Results and Discussion: We randomized 200 patients per group (mean age 68 years, 56% female). The PEEPIND group had a PEEP of 11 (9 to 11) cm H2O during SLV and 9 (7 to 9) cm H2O during DLV, compared to 5 cm H2O in the PEEP5 group. PPCs occurred in 28% of PEEPIND patients (54/195) and 25% in PEEP5 patients (50/197) (RR 1.09 [95% CI 0.79 to 1.52], P=0.604).

In high-risk patients (ARISCAT score ≥43), PEEPIND showed a protective effect. Secondary outcomes showed no significant dif-

Conclusion(s): Among older patients undergoing lung resection with SLV, individualized PEEP did not reduce PPCs overall compared to fixed PEEP of 5 cm H2O but demonstrated a protective effect in high-risk patients.

33AP07-10

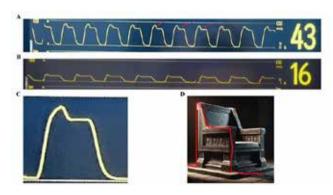
Evolving capnograph after disorder of pulmonary circulation during mechanical ventilation with double lumen tube: a case report

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Background: Capnography is an indispensable tool for monitoring metabolic and respiratory functions[1]. This case report presents a "throne-like" pattern observed in capnography signalled a pulmonary circulatory disorder.

Case Report: A 69-year-old woman was admitted to hospital with haemoptysis and productive cough. On the third day after admission, thoracoscopic-assisted anterior segmental resection of the right upper lobe was scheduled under general anaesthesia, with a left DLT following induction. Before closing the surgical incision, bilateral lung ventilation was resumed, the capnogram displayed a shape resembling a throne (Figure 1A, C, D). However, with right OLV, a rapid decrease in end-tidal carbon dioxide (ETCO₂) values occurred (Figure 1B), accompanied by decreased blood pressure and a rapid reduction in peripheral capillary oxygen saturation (SpO₂) to below 70 (FiO₂ = 1.0). Upon re-establishing two-lung ventilation, the capnogram again displayed a throne-like appearance. Then, the surgeon found that a titanium nail in the right upper lobe was compressing the right pulmonary artery. The nail was removed, and surgical silk sutures were applied manually. Bilateral lung ventilation was resumed without the recurrence of the throne-like capnogram.



Discussion: This case identifies a novel abnormal capnogram, the throne-like pattern, which is indicative of disordered pulmonary artery circulation. DLTs are not routinely employed in endotracheal intubation. Hence, abnormal capnogram during DLT use are rarely reported. This unique throne-like waveform may signal pulmonary circulation impairment, which is similar with pulmonary embolism (PE). For patients at elevated intraoperative PE risk, DLT might be a better choice.

Reference:

- 1. Aminiahidashti, H, Shafiee, S, Kiasari, A Z, et al. Applications of end-tidal carbon dioxide (ETCO₂) monitoring in emergency department; a narrative review [J]. Emergency, 2018, 6(1): e5. **Learning Points:**
- 1. A throne-like pattern of capnogram during DLT use suggests a pulmonary circulation disorder.
- 2. For patients with a high intraoperative PE risk, DLT may be a preferable option for enhanced intraoperative detection.

33AP07-11

Postoperative pain treatment with repeated boluses of ropivacaine via Transversus Thoracis muscle Plane block (TTP) catheters with median sternotomy patients

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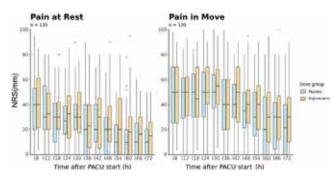
Background and Goal of Study: Median sternotomy causes major postoperative pain. Single shot TTP blocks may be effective to alleviate sternal pain. Previous results indicate that continuous infusion with ropivacaine could be beneficiary after sternotomy.¹ We hypothesized that repeated boluses of ropivacaine via TTP catheters would be associated with better and more durable pain relief, lower required cumulative dose of opioids, shorter ICU and hospital length of stay and less opioid related adverse effects in median sternotomy patients compared to placebo.

Materials and Methods: We conducted a double-blinded, randomized, placebo-controlled prospective trial with 120 patients (age 18–80 years) undergoing elective open cardiac surgery. After informed consent, patients were randomized to receive repeated boluses of either saline or ropivacaine via TTP catheters for 72 hours postoperatively.

Primary endpoint was the patient reported pain scores with numeric rating scale. Secondary endpoints were cumulative oxycodone dose, incidence of local anaesthetic systemic toxicity or other adverse events and the effect on ICU and hospital length of stay.

Results and Discussion: Patient reported pain scores did not differ between groups. Sternal pain was significantly more common in the placebo-group compared to the ropivacaine-group 24-hours postoperatively (p=0.039) but no other differences were seen in pain location. Cumulative oxycodone requirement did not differ between groups. Postoperative nausea and vomiting (PONV) was common in both groups (38%) and subgroup analysis revealed a higher incidence of PONV in the ropivacaine-group undergoing heart valve replacement (p-value 0.012), but no differences were recorded between the main groups. ICU or hospital length of stay were not affected.

Conclusion(s): Repeated boluses of ropivacaine via TTP catheters had no significant effect on pain recordings or cumulative amount of opioids compared to placebo. It remains unclear whether the timing or administration mode of the TTP blocks affect the success of postoperative pain therapy.



References:

1. Zhan et al 2024, Journal of Cellular and Molecular Medicine

33AP07-12

Robotic tracheobronchoplasty from the perspective of anesthetic assistance: a case report

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Background: Robotic Surgery is a growing trend, being used in many surgical specialties. This case report presents successful anesthetic management for an innovative technique in robotic thoracic surgery.

Case Report: A 61-year-old woman, 100kg and 1.60m, submitted to robotic tracheobronchoplasty under general anesthesia. History of severe, refractory asthma, complicated by tracheomalacia, using Beclometasone + Formoterol + Glycopyrronium and Salmeterol + Fluticasone.

3 Salbutamol puffs were administered just before anesthetic induction, which was performed with Fentanyl, Propofol and Rocuronium. Intubation was performed with a double-lumen endobronchial tube, and bronchoscopy was necessary for selective placement due to the patient's anatomical variations. An arterial line was placed for monitoring, and positioning was performed in left lateral decubitus. Maintenance was achieved with continuous infusion of Propofol, Remifentanil and Rocuronium. Adjuvants included Ketamine, Methadone, Magnesium Sulfate, Lidocaine and Dexmedetomidine. Tranexamic acid was administered to reduce risk of bleeding.

During the surgical procedure, selective ventilation and periods of apnea were required for tracheal suturing. Alveolar recruitment maneuvers and adjustments to mechanical ventilation were performed. Arterial blood gas samples showed adequate ventilatory control after sequential apneic periods and the patient was extubated in the operating room without incidents. She was discharged 7 days later without complications.

Initial	pH 7,38 PCO2 48 PO2 81 HCO3 28,4 SatO2 96
Post-apnea	pH 7,24 PCO2 66 PO2 80 HCO3 28,3 SatO2 93
Final	pH 7,38 PCO2 49 PO2 84 HCO3 29 SatO2 96

Discussion: Robotic-assisted tracheobronchoplasty has been first described in the last 10 years¹, and anesthesia for this procedure presents additional challenges with the use of the robotic

system, the need for immobility and intermittent ventilatory maneuvers. This case demonstrates a successful approach in challenging scenario.

References:

1. Lazzaro, Richard S., Byron Patton, et. al. 2019. "First Series of Minimally Invasive, Robot-Assisted Tracheobronchoplasty with Mesh for Severe Tracheobronchomalacia" Journal of Thoracic and Cardiovascular Surgery 157 (2): 791-800. https://doi. org/10.1016/j.jtcvs.2018.07.118

Learning points: This report highlights an effective anesthetic strategy in a novel environment and aims to encourage the exchange of clinical experiences in the use of new technologies.

Infection, Sepsis and Immunology

34AP01-2

The SPRED study - multiomic prediction of surgical site infections after major abdominal surgery

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Background and Goal of Study: Postoperative complications, including surgical site infections (SSIs), affect up to 44% of major surgeries, increasing mortality, hospital stays, readmissions, and socioeconomic costs. Predicting an individual's risk of postoperative complications is difficult, as established scores based solely on clinical factors, like the ACS NSQIP, have limited predictive power.

The SPRED study aimed to create a predictive model for SSI after major abdominal surgery1 by integrating clinical and biological factors measured before surgery, enabling personalized surgical management.

Materials and Methods: In a five-center prospective study of 164 adult patients undergoing elective major abdominal surgery in France, SSIs were tracked within 30 days post-surgery. Preoperative clinical data, including demographic and health variables, were collected. A plasma proteomic approach (Olink) measured 726 proteomic features in pre-surgery blood samples.

Sparse machine learning and data-driven feature selection² using the Stabl framework were applied to build a multivariable model predicting SSIs. Model performance was evaluated via Monte Carlo cross-validation (5-fold repeated 10 times) and compared to the ACS risk score3.

Results and Discussion: A multivariable model combining clinical and proteomic data outperformed the ACS model in predicting SSIs (area under the receiver operating characteristic curve, AU-ROC = 0.79; [0.70-0.88] vs. AUROC = 0.50 [0.38-0.63]). Stabl identified three proteins (CXCL14, NCAM1 and FABP6) and two clinical factors (ASA score and surgery indication) as key predic-

Conclusion(s): The integrative predictive model provides significantly greater accuracy in predicting SSIs compared to conventional clinical preoperative risk factors. Our analysis identified a concise set of biomarker candidates that could be used to personalize perioperative management. These findings highlight the potential of predictive approaches to identify high-risk patients before surgery, enabling targeted interventions to reduce SSIs and improve outcomes.

References:

- 1. NCT05523713: Development and Validation of a Predictive Score for Surgical Site Infections, SPRED
- 2. Hédou, J., et al. Discovery of sparse, reliable omic biomarkers with Stabl. Nat Biotechnol, 2024
- 3. Bilimoria KY, et al. Development and evaluation of the universal ACS NSQIP surgical risk calculator: a decision aid and informed consent tool for patients and surgeons. J Am Coll Surg., 2013

34AP01-3

Effect of dexmedetomidine versus midazolam on short-term and long-term survival outcomes in patients requiring ventilation with sepsis: a retrospective cohort study with propensity score matching

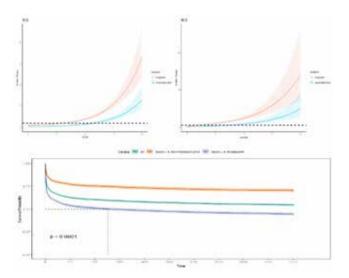
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Background and Goal of Study: The impact of dexmedetomidine and midazolam on the survival outcomes of sepsis patients, particularly long-term survival, has not yet been conclusively estab-

Materials and Methods: We conducted a retrospective cohort analysis of sepsis patients requiring ventilation from 2008 to 2022, utilizing data from the MIMIC-IV database. Inclusion criteria were patients diagnosed with sepsis according to Sepsis-3 criteria after ICU admission. The exposure factors were dexmedetomidine or midazolam during ventilation.

The primary endpoint was 28-day mortality, while the secondary endpoint was 10-year mortality. To address baseline differences, propensity score matching (PSM) was used, along with multivariate logistic regression and Cox proportional hazards models to account for residual confounding.



Results and Discussion: The original cohort included 6,622 patients, and after PSM, 5,028 patients remained. In the original cohort, the 28-day mortality was 24.86% (1,646/6,622), while the 10-year mortality was 45.67% (3,024/6,622). Both in the original and matched cohorts, the midazolam group had higher 28-day and 10-year mortality rates compared to the dexmedetomidine group (31.2% vs. 13%, P < 0.001; 20.6% vs. 13%, P < 0.001 for 28day mortality, and 55.5% vs. 29.6%, P < 0.001; 40.9% vs. 29.6%, P < 0.001 for 10-year mortality). In logistic and Cox regression models, the dexmedetomidine group consistently demonstrated a protective effect against 28-day mortality, with odds ratio and hazard ratio significantly below 1, even after PSM and multiple weighting methods, such as IPTW, SMRW, PA and OW (P < 0.01

The Kaplan-Meier curves and restricted cubic spline curves further confirmed the protective effect of dexmedetomidine, and interestingly, the magnitude of benefit increased with higher SOFA score or lactate level.

Conclusion(s): The findings suggest that dexmedetomidine significantly improves both short-term and long-term survival outcomes in sepsis patients requiring ventilation, compared to midazolam. These results underline the potential for dexmedetomidine to be favored in ICU sedation protocols for sepsis management.

34AP01-4

Multidrug-resistant bacteria burden in ICU critically ill patients: where do we stand in the last 5 years?

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Background and Goal of Study: Multidrug-resistant bacteria (MDR) remain a health threat to Intensive Care Units (ICU) worldwide. These rates might have been further aggravated by the impact of the COVID-19 pandemic due to increased antibiotic prescriptions.

We aimed to describe the rate, characteristics, and outcomes of critically ill patients with MDR-causing ventilator-associated pneumonia (VAP) before and during the COVID-19 pandemic

Methods: We conducted an observational cohort study from 2018 to 2022. The study included adult, mechanically ventilated patients for > 48 hours with bronchoalveolar lavage (BAL) due to clinical suspicion of VAP. Patients were categorized based on having MDR-causing VAPs and considering being previous to or during the COVID-19 pandemic.

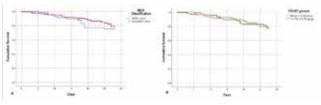


Figure 1.

Results and Discussion: A total of 217 patients were enrolled, with 65 (29.9%, 4 patients with Extensively Drug-resistant bacteria) included in the MDR cohort and 152 (70.1%) in the non-MDR cohort. Patients in the MDR cohort presented similar multiorgan support requirements, ICU lengths of stay, and mortality rates to those in the non-MDR group (Figure 1).

There was no difference between the rate of diagnosis of MDRcausing VAPs from 2018 to 2022. Patients were divided into the Before (91 patients) and the During COVID-19 groups (126 patients). Despite higher SAPS II and multiorgan organ support requirements in the During-COVID-19 group, no difference was found in the MDR profile and mortality rates between groups. The Cox regression modeling demonstrated no difference in mortality after adjustment (Hazard Ratio 1.010, 95% CI: 0.987-1.018, p=0.682) (Figure 1). Multivariable logistic regression analysis revealed a significant risk contribution of age and SOFA score to ICU mortality (OR 1.061 (95% CI: 1.020-1.103; p=0.003) and 1.271 (95% CI: 1.102-1.466; p=0.001), respectively).

Conclusion(s): Our findings indicate that the rate of MDR-causing VAPs remained stable over the years studied and did not independently predict worse clinical outcomes or increased mortality. Instead, overall illness severity, as reflected by age and SOFA scores, emerged as the primary determinants of ICU mortality.

34AP01-5

Diagnostic accuracy of presepsin for sepsis in severe burn patients: a prospective cohort study

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Background and Goal of Study: Sepsis remains a leading cause of mortality in severe burns, with traditional diagnostic methods facing significant limitations. Blood culture testing often yields delayed or false-negative results, especially with early antibiotic administration. While conventional biomarkers like procalcitonin (PCT) and C-reactive protein (CRP) show limited utility due to burn-induced inflammation, presepsin has emerged as a promising biomarker.

This study aimed to evaluate the diagnostic value of multiple biomarkers, including presepsin, PCT, and CRP, for sepsis detection in severe burns, specifically analyzing their performance in both blood culture-positive and -negative cases.

Materials and Methods: A prospective diagnostic accuracy study was conducted at the Burn Intensive Care Unit of Hallym University Hangang Sacred Heart Hospital between January 2021 and December 2022. From 370 initially screened patients, 221 were included in the final analysis. Sepsis was defined according to Sepsis-3 criteria. Seven biomarkers were selected: presepsin, procalcitonin, albumin, CRP, PT, hematocrit, and cystatin C. Diagnostic performance was evaluated through ROC analysis, decision curve analysis, and reclassification analysis.

Results and Discussion: Presepsin demonstrated the highest overall diagnostic accuracy (AUC 0.810, 95% CI: 0.742-0.878), with optimal sensitivity of 82.6% and specificity of 72.2% at a cutoff value of 472.0 pg/mL. Its performance was significantly higher in blood culture-negative cases (AUC 0.846) compared to positive cases (AUC 0.604, p=0.015).

Decision curve analysis showed presepsin maintained positive net benefit across various threshold probabilities, particularly in culture-negative cases. Albumin showed significant improvements in both IDI (0.142, p<0.001) and NRI (0.609, p<0.001) when combined with presepsin. High antibiotic resistance rates were observed, with A. baumannii being the predominant pathogen (47.1%) and resistance rates highest for penicillins (84.6%).

Conclusion(s): Presepsin demonstrates superior diagnostic value for sepsis in severe burns, particularly in culture-negative cases. The study supports a combined biomarker approach, especially presepsin with albumin, for improved diagnostic accuracy. Given the high antimicrobial resistance and limitations of traditional diagnostics, presepsin-based strategies could enhance both diagnostic accuracy and antibiotic stewardship in burn-related sepsis management.

34AP01-6

The therapeutic potential of Irisin in preventing fetal brain damage and cognitive deficits caused by maternal inflammation

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Background and Goal of Study: Maternal infections can cause severe complications, triggering inflammation that harms fetal brain development and leads to long-term neuropsychiatric issues. Exercise reduces neuroinflammation and enhances neurogenesis, with irisin playing a key role.

This study investigates the effect of maternal irisin injections on hippocampal apoptosis and learning in offspring, aiming to reduce brain damage from maternal infections.

Materials and Methods:12 female Sprague Dawley rats were divided into three groups: Control (C)(saline), lipopolysaccharides (LPS)(100 µg/kg), and Irisin+LPS (I+LPS)(2 µg/kg irisin on E16, E17, E18, followed by 100 μg/kg LPS). Offspring underwent novel object recognition tests at 30 days old. GFAP, Caspase-3 and cytochrome-c levels were analyzed immunohistochemically to assess apoptosis in hippocampus.

Statistical analysis was conducted using SPSS. Normality was assessed with the Shapiro-Wilk test. The Kruskal-Wallis test was used for non-normally distributed data, while One-Way ANOVA and paired t-tests were used for normally distributed data.

Results and Discussion: The C and I+LPS group spent more time exploring the novel object (p=0.03 and p=0.047, respectively). while the LPS group showed no preference. This suggests irisin may protect against LPS-induced cognitive deficits.

In the CA1 region, caspase 3 immunoreactivity was higher in the LPS group than the C, though not significantly. It was higher in the LPS group compared to I+LPS (p=0.001), with I+LPS showing lower levels than C (p=0.005). In the CA3 region, the I+LPS group had lower caspase 3 levels than LPS (p=0.000).

For cytochrome-C, the LPS group showed higher immunoreactivity in the CA1 (p=0.022) and DG (p=0.001) regions compared to the C, while the I+LPS group had lower levels than the LPS in the CA1 region (p=0.004).

The C group had fewer GFAP(+) cells than both LPS (p=0.000) and I+LPS groups (p=0.017).

Previous studies have shown that LPS administration leads to activation of phagocytic cells. In our study, LPS administration resulted in increased levels of apoptotic markers and phagocytic cells, while in the irisin-treated group, this increase was limited.

Conclusion(s): Irisin protects against LPS-induced hippocampal damage, enhancing cognitive function and reducing apoptosis in offspring. These findings suggest irisin as a potential therapeutic strategy to protect fetal brain development from maternal infection-related damage.

34AP01-7

The prognostic significance of the relationship between absolute neutrophil and lymphocyte counts (NLR) and C-reactive protein and lymphocyte counts (CLR) in patients with **COVID-19 infection**

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Background and Goal of Study: During the COVID-19 pandemic, it was crucial to predict the deterioration of the general condition of patients in the early stage of the disease. Better survival rates were achieved by identification of at-risk patients and by their early admission to the ICU. The purpose of this research was to determine whether the patients with potentially more severe clinical picture who required initial treatment in the ICU could be identified by monitoring simple and accessible laboratory parameters.

The aim of the research was to determine whether there is a statistically significant difference in the values of NLR(neutrophillymphocyte ratio) i CLR(CRP-lymphocyte ratio) between two groups of patients with confirmed COVID-19 infection, one treated in the ward and the other treated in the ICU.

Materials and Methods: This retrospective epidemiologic study investigated 398 patients treated at the Institute for Pulmonary Diseases of Vojvodina, Sremska Kamenica, Serbia during 2021. 26.6% of the patients were treated in the ICU, whereas 73.3% of the patients were treated in the ward. CBC, CRP, NLR and CLR were analyzed in all patients upon admission.

Statistical data processing was performed using SPSS version 23.0. In order to test for differences in the predictive capabilities of the examined parameters, the AUC ROC were compared with each other, determining whether there was a significant statistical difference between the areas under the ROC curves for specific parameters.

Results and Discussion: Both tested indices, NLR and CLR, were statistically significantly higher in the group of patients treated in the ICU compared to the ward group, as shown in Table 1.

Index	Admission to the ICU	Median	Interquartile range	р
NLR	No	7.02	3.778 - 13.276	0.003
	Yes	9.02	5.725 - 16.041	
CLR	No	95.28	34.099 - 186.083	< 0.001
	Yes	147.82	63.506 - 280.615	

Table1: Indices NLR and CLR in subjects treated in the ICU/ward

Conclusion(s): In our research, we have proven that NLR and CLR are significant for assessing the severity of COVID-19 infection. Due to their easy availability and simplicity, along with other clinical parameters, they are important for evaluating the need for treatment in the ICU, where the beds occupied by patients during the COVID-19 pandemic were referred to as "golden beds".

34AP01-8 FLUIDS: FLUid management and InDividualized resuscitation in Sepsis - study protocol

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Background: Sepsis is a life-threatening condition marked by organ dysfunction from an uncontrolled host response to infection. Early hemodynamic resuscitation is crucial to prevent organ failure and death, but current standardized approaches may result in prolonged shock or fluid overload.

This study evaluates personalized hemodynamic resuscitation guided by the Baxter Starling SV monitor for sepsis patients during the first six hours of emergency department (ED) admission compared to standard care.

Methods: This randomized open-label clinical trial, conducted in the ED at the University Medical Centre Groningen (UMCG), will enroll 174 adult patients with suspected infection in need of hemodynamic resuscitation over 16 months.

Participants will be randomly assigned to either the intervention group, utilizing the Starling SV monitor, or the control group receiving standard care. The intervention involves i.v. fluid resuscitation and vasopressor therapy based on fluid responsiveness assessment (i.e. Δcardiac index >10%) after a passive leg raise and fluid boluses measured by the monitor.

Standard care will be provided at the discretion of the treating physician, following the Surviving Sepsis Campaign (SSC) recommendation of administering 30 ml/kg of i.v. fluids.

Study endpoints: The primary endpoint is the volume of intravenous fluids administered within six hours of ED admission. Secondary endpoints include vasopressor use, organ failure, hemodynamic stabilization, length-of-stay, and adverse events.

Expected results: By dynamically assessing fluid responsiveness, we expect the intervention group to receive less intravenous fluid compared to the standard care protocol of 30 mL/kg/3h. Additionally, earlier initiation of vasopressor therapy is anticipated. This personalized approach aims to optimize sepsis management, reduce complications, and improve outcomes by tailoring fluid administration and timely vasopressor use to the individual hemodynamic state.

IRB approval is pending, last phase. Study will start in the course of 2025.

34AP01-10

The importance of aseptic techniques in invasive procedures: a case of iatrogenic immunosuppression and psoas abscess secondary to corticosteroid therapy

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Background: Invasive procedures of the neuroaxis require stringent aseptic techniques to prevent rare, yet serious infectious complications. This report presents a case of a psoas abscess following multiple diagnostic lumbar punctures.

Case Report: A 66-year-old male, ASA II, was admitted to the neurology department with general malaise, muscle weakness in the lower limbs and progressive distal paresthesias, over two months. Multiple diagnostic lumbar punctures were attempted. The patient was diagnosed with Chronic Inflammatory Demyelinating Polyneuropathy, whose treatment involved five days of intravenous immunoglobulin, followed by five days of intravenous methylprednisolone.

Nine days post-discharge, he presented to the emergency department with persistent atraumatic left-sided pubic pain and fever. Imaging revealed a left-sided psoas abscess extending distally toward the ipsilateral thigh, with suspected femoral head osteomyelitis. Targeted antibiotic therapy was initiated based on microbiological findings.

He underwent the first stage of surgical intervention seven weeks later. This involved cephalic femoral resection, microbiologic sampling, debridement, and hemiarthroplasty with a PMMA-G-ciprofloxacin-stabilized spacer. Antibiotic therapy continued postoperatively. After favorable clinical and radiologic progress, the spacer was removed, and a total hip arthroplasty performed.

Discussion: Lumbar punctures are generally considered low-risk for infection, but repeated attempts in special populations may increase the likelihood of complications. Immunosuppression further predisposes patients to infections such as psoas abscesses, a rare but severe condition with potential complications like os-

This case underscores the importance of an aseptic technique in neuroaxis procedures, especially in patients with iatrogenic immunosuppression. Asepsis protocols and judicious use of corticosteroids are critical to ensure patient safety and reduce morbidity.

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1. Hebl, JR. The Importance and Implications of Aseptic Techniques During Regional Anesthesia. Reg Anesth Pain Med. 2006 Jul-Aug;31(4):311-23. doi: 10.1016/j.rapm.2006.04.004.

Learning Points: Strict aseptic technique is essential in invasive procedures, especially in patients receiving immunosuppressive therapy.

34AP01-11

Lemierre's syndrome: a rare condition with a possible devastating end

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Background: Lemierre syndrome (LS) is a rare complication of oropharvngeal infection and involves infection spreading into the lateral pharyngeal spaces of the neck with subsequent septic thrombophlebitis of the internal jugular vein(s). It's associated with bacteraemia caused primarily by anaerobic organisms. The diagnosis of LS is often elusive on initial presentation.

Case Report: A healthy 18-year-old young man, with no medical history and allergies, begins with fever and odynophagia. Amoxicillin/clavulanic acid was prescribed, but was stopped after the first dose due to skin erythema. One week later, returned to the emergency room due to fever, prostration and eyelid oedema. He was observed by ophthalmologist and diagnosed with severe cellulitis.

On physical examination, Glasgow scale 13 with slurred speech and neck stiffness. Blood tests showed leukocytosis with neutrophilia and C reactive protein 31mg/dL. Head computerized tomography (CT) revealed cellulitis with post-septal involvement. Lumbar puncture: cloudy cerebrospinal fluid, 1200 cells, proteins 141 and glucose 10mg/dL. Blood cultures were done and was admitted to the intensive care unit and began antibiotic therapy with ceftriaxone and metronidazole.

Due to lack of improvement and right hemiparesis, underwent magnetic resonance imaging and a venous CT scan which identified subdural empyema; cavernous sinus, left internal and external jugular veins thrombosis and ischemic vascular lesions in the territory of the left middle cerebral artery.

Cervical and thoracic CT revealed abscesses of the peri-tonsillar space, right pneumothorax and bilateral pleural effusion. A chest tube was inserted, with pleural fluid suggestive of empyema. Anticoagulation was started, otorhinolaryngology and thoracic surgery was required to source control.

All microbiological tests were negative, and antibiotic therapy was ended after two and a half months due to evidence of focus control and was discharged to a rehabilitation clinic.

Discussion: LS can lead to a series of complications: thrombosis may spread superiorly into the cavernous sinuses; septic emboli can affect several organs; septic shock and ultimately death. Adequate antibiotic therapy, supportive care and monitoring play a significant role.

Learning Points: Despite the low incidence, this case highlights the importance of a high level of suspicion for the LS. Exhaustive investigation, early recognition and treatment is crucial to improving the prognosis.

34AP01-12

The double-edged sword of LRINEC: diagnostic hurdles in necrotizing fasciitis detection

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Background: Necrotizing fasciitis (NF) caused by S. pyogenes is a rapidly progressing, severe, life-threatening condition often complicated by sepsis and multi-organ failure (MOF). Early clinical identification is challenging, as NF often resembles various soft tissue infections (STI) in its initial stages.

The Laboratory Risk Indicator for Necrotizing Fasciitis Score (LRINECs) is a scoring system that helps distinguish NF from other STI and includes these laboratory parameters: C-reactive protein, total white cell count, hemoglobin, sodium, creatinine, and glucose levels. Scores ≤5 indicate low risk, while scores of 6-7 and ≥8 correspond to moderate and high risk, respectively.

Case Report: A 38-year-old female with obesity, mitral valve replacement due to rheumatic heart disease (Acenocumaril as anticoagulant therapy), chronic heart failure, and ulcerative pancolitis presented to the emergency department with fever, odynophagia, and left ankle swelling following recent trauma. Initial laboratory tests revealed an INR of 10 and LRINECs of 5.

Eight hours post-admission, after partial INR correction, the patient developed sweating, tachycardia, and hemodynamic instability, prompting ICU admission. Blood cultures were positive for S. pyogenes. CT angiography revealed free fluid in deep tissue planes, subfascial fluid collections of deep anterior compartment of the leg involvement.

The LRINECs rose to 6 at this stage. A hematoma was suspected due to a history of trauma and coagulation disorder at admission. Eighteen hours after admission the patient progressed to MOF and died three days post-admission despite intensive care.

Discussion: The LRINECs is a diagnostic tool with a sensitivity of 68.2% and specificity of 84.8% when values are above 6 (1). In this case, excessive anticoagulation and presumed hematoma masked early NF signs, delaying definitive diagnosis.

Reference:

Fernando, S. M. et al. Necrotizing Soft Tissue Infection: Diagnostic Accuracy of Physical Examination, Imaging, and LRINEC Score. Ann Surg 269, 58-65 (2019)

Learning Points: The LRINEC score supports NF suspicion staging but should not replace clinical judgment and imaging. LRINECs helps in staging suspicion of NF. However, clinical experience and continuous patient reevaluation remain essential in providing rapid diagnostic and therapeutic guidance for patients with suspected NF.

*We own an exemption of consent from our center ERB and permission to submit from the ESAIC Secretariat.

Acute kidney injury in early-stage sepsis, an early alarm for increased mortality in emergency departments

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Background and Goal of Study: Sepsis is the most prevalent cause of acute kidney injury (AKI) and is associated with an increased risk of subsequent multiorgan failure, cardiovascular events and death.

This study explores the largely unknown impact of AKI on mortality and cause of death in early-stage sepsis within an emergency department (ED) population.

Materials and Methods: This cohort study utilized prospectively collected data from the cohort Acutelines (2020-2023). AKI was determined by the KDIGO criteria. Kaplan Meier curve analyses, univariable and multivariable Cox regression analyses were used to evaluate the association of AKI with all-cause mortality as primary endpoint, and in-hospital mortality and cardiovascular cause of death as secondary endpoints, with and without adjustment for potential confounders.

Results and Discussion: In this study 2 045 patients with earlystage sepsis (median age 67 years, 55% male) were included, of which 246 (12%) had AKI. Over a median follow-up of 346 days, 506 people (25%) died. AKI was associated with significantly higher all-cause mortality (38% vs. 23%:P<0.001), even in a subanalysis excluding patients who needed ICU care during hospitalization (P<0.001).

After adjusting for sex, age, comorbidities, and sepsis severity, AKI remained independently associated with an increased risk of all-cause mortality (HR 1.44, 95% CI 1.14-1.82, P=0.003). Moreover, AKI was linked to a higher in-hospital mortality (HR 1.64, 95% CI 1.16-2.34, P=0.006) and cardiovascular cause of death (HR 2.49, 95% CI 1.39-4.48, P=0.002).

Our study uniquely demonstrates that AKI's adverse impact on outcomes is evident already at the ED, even when considering only patients who received treatment exclusively outside the ICU. Our focus on the ED population bridges an important gap in understanding sepsis-AKI prognostication, extending the implications beyond ICU settings.

Our findings highlight the need to address sepsis-AKI already at the ED, since these patients may benefit from future targeted therapies and appropriate follow-up care, including monitoring for cardiovascular and kidney complications.

Conclusion(s): AKI is independently associated with all-cause mortality, in-hospital mortality, and cardiovascular cause of death in patients with early-stage sepsis at the ED. Notably, this is evident even in patients who did not require ICU care, underscoring that AKI's adverse impact on outcomes occurs early in the care continuum.

34AP02-2

Personalized fluid therapy in early septic shock: impact on volume and lactate clearance

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Background and Goal of Study: Fluid resuscitation is a critical component of early management in patients with septic shock. The 2021 Sepsis Surviving Campaign (SSC) guidelines recommend administering 30 mL/kg of balanced crystalloids within the first 3 hours of diagnosis. However, this standard approach does not fully align with the principles of personalized medicine.

This study aimed to investigate whether dynamic hemodynamic assessment methods can individualize fluid therapy during the early phase of septic shock.

Materials and Methods: This randomized controlled trial included 47 patients with septic shock, enrolled within 3 hours of ICU admission and randomly assigned to one of two groups. In the Dynamic Assessment Group (Group 1, 23 patients), fluid resuscitation decisions were guided by Pulse Pressure Variation (PPV), measured every 15 minutes. If PPV exceeded 12%, a 400 mL bolus of balanced crystalloids was administered. In contrast, the Fixed-Dose Group (Group 2, 24 patients) received a standardized infusion of 30 mL/kg of balanced crystalloids.

The study compared the fluid volumes administered and lactate dynamics between the two groups during the first 3 hours of intensive care. Both groups received standard treatments in accordance with the 2021 SSC guidelines.

Results and Discussion: A statistically significant difference in fluid administration was observed between the groups (p = 0.0229).

Group 1, guided by PPV monitoring, had a lower average fluid administration (27.85 mL/kg) compared to the fixed 30 mL/kg in

The effect size (Cohen's d = -0.6796) indicated a moderate difference, with greater variability in fluid volumes in Group 1 (standard deviation = 4.47) versus Group 2 (standard deviation = 0.0). Despite these differences, lactate clearance outcomes were not significantly different between the two groups (p = 0.7648).

Conclusions: The study highlights significant variability in fluid requirements during the initial phase of septic shock. The standard fixed-dose approach results in higher cumulative fluid volumes, whereas an individualized approach reduces the fluid volume in most patients.

This personalized strategy allows clinicians to determine more precisely when a patient no longer benefits from additional fluids. However, no significant difference in lactate clearance was observed between the two methods. Further research is necessary to explore whether individualized fluid management improves long-term patient outcomes.

Exploring the potential of Netrin-1 as a prognostic indicator and therapeutic target in sepsis

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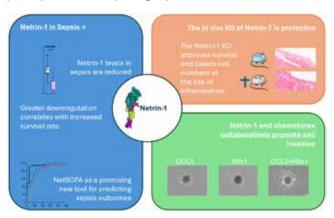
Background and Goal of Study: The neuronal guidance protein Netrin-1 has been recognized for its dichotomous role in the immune system: while it suppresses acute inflammation, it also promotes chronic inflammation. We demonstrated that netrin-1 is downregulated in septic patients, and patients with lower initial netrin-1 levels presented a better clinical outcome.

Furthermore, we found that inhibiting netrin-1 in septic mice improved survival. Currently, we are developing a new prognostic tool for sepsis patients, the NetSOFA score, and have uncovered in vitro a mechanism that explains the improved survival observed in septic patients with decreased netrin-1 level and in septic mice that lack netrin-1.

Materials and Methods: In a cohort of 39 critically ill sepsis patients and 18 controls, we measured plasma netrin-1 levels on day one alongside clinical parameters obtained from electronic health records (IRB 249/20 S-EB). We generated three tissue-specific netrin-1 knockout mouse models (IACUC: ROB-55.2,2532. Vet 02-21-206). Sepsis was induced using cecal ligation and puncture. In vitro, we evaluated the invasion of human cells from a spheroid into a collagen matrix under the influence of netrin-1 ± chemokines.

Results and Discussion: In patients surviving sepsis, we observed a decrease in netrin-1 levels. When combining the netrin-1 level with the SOFA score, the NetSOFA score demonstrates superior prognostic accuracy of survival compared to the individual parameters alone. In septic mice, wild-type animals showed significantly worse survival outcomes than neutrophil/monocyte-specific knockout animals. Moreover, wild-type littermates exhibited elevated immune cell counts in the peritoneal cavity, while chemokine concentrations remained comparable between groups. Additionally, we observed that netrin-1 and chemokines together orchestrate cell invasion in-vitro.

Conclusion(s): In summary, Netrin-1 emerges as a promising diagnostic marker for sepsis. Furthermore, its role in modulating immune responses suggests that targeting Netrin-1 may hold therapeutic potential for improving sepsis outcomes.



Acknowledgements: Netrin-1 spatial structure: R. Reuten

34AP02-4 Sexual dimorphism in neutrophil function

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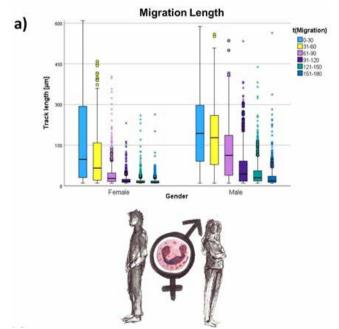
Background and Goal of Study: Women and men are different on many biological levels. Mounting evidence is now recognized that even the immune system has some significant sex differences. which are mainly cell-mediated.

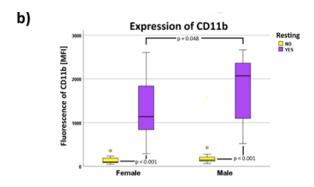
This study investigated sex-specific differences in function and regulation of polymorphonuclear neutrophil granulocytes (PMNs) in male and female healthy human donors to gain a deeper understanding of the immune response and potential sex-specific dimorphism in immunology [1].

Materials and Methods: PMNs were isolated from whole blood samples of healthy female and male donors by density centrifugation. Afterwards a µ-slide chemotaxis assay was conducted, where N-formylmethionin-leucyl-phenylalanine (fMLP) enticed PMNs' ability for chemotactic migration and production of reactive oxygen species (ROS), release of myeloperoxidase (MPO) and formation of Neutrophil Extracellular Traps (NETs) were measured. In addition, functional differences of surface epitopes CD62L, CD11b, CD66b and oxidative burst on PMNs from male and female donors were investigated with a flow cytometry as-

Results and Discussion: Sex specific differences of neutrophil function could be determined. Male-derived PMNs initially migrated further distances (figure 1a), while female-derived PMNs showed more targeted movement.

However, as the observation period progressed, male-derived PMNs began to exhibit more targeted migration, maintaining straightness towards the end. Differences in neutrophil surface marker expression were observed, with higher levels of CD11b (figure 1b) and CD66b on male-derived PMNs after 2 h resting. The different immune effects between the genders were seen in live cell imaging as well as in flow cytometry analyses.





Conclusion(s): The study found clear functional differences between PMNs from male and female donors. To gain reliable results in future PMN studies, it is crucial to take a donor's gender into account.

References:

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34AP02-5 SPP1 mediated synaptic damage through activation of microglia and promoted the occurrence of septic-associated encephalopathy

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Background and Goal of Study:Osteopontin, also known as secreted phosphorylated protein-1, has cytokine, chemokine and signal transduction function. Previous studies have found that SPP1 is related to AD. However, there are few reports on whether SPP1 is associated with the occurrence of sepsis-associated encephalopathy(SAE).

Thus, the goal of this study is to explore the pathogenic mechanism of SPP1 in SAE.

Materials and Methods: Sepsis was induced by Cecal ligation and puncture (CLP) procedure. The open field test, Y maze and novel object recognition test were used to assess cognitive function. The expression of SPP1 in the hippocampus was examined by

gRT-PCR, western blotting and immunofluorescence.

Quantitative data are displayed as the means ± standard deviations and were analyzed by ANOVA. All experiments were carried out at least in triplicate. Student's t test was utilized as a post hoc test. P < 0.05 was considered statistically significant.

Results and Discussion: In the CLP model, the mice showed cognitive dysfunction (Figure A). The expression level of SPP1 in hippocampus of SAE mice was increased, the expression level of Synaptophysin was decreased, and microglia was activated (Figure B-C).

Conclusion(s) Sepsis mice showed cognitive dysfunction, increased expression of SPP1 in the hippocampus, microglial activation, and synaptic damage

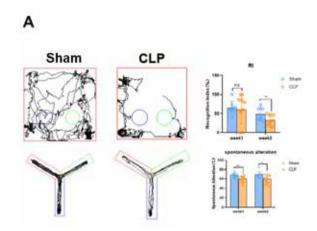


Figure A. Representative chart of Y maze and the novel object recognition.

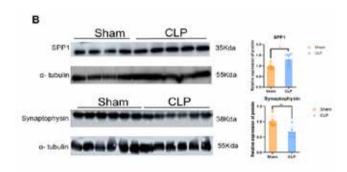


Figure B. Representative Western blotting images of samples.

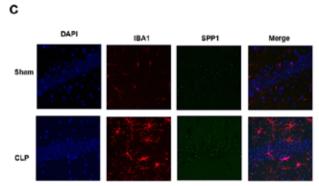


Figure C. Representative immunofluorescent images.

Revisiting the applicability of microRNAs as biomarker in sepsis associated acute kidney injury: a cohort-based analysis

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Background and Goal of Study: Sepsis is a life-threatening body response to an infection which is frequently complicated by sepsis-associated acute kidney injury (SA-AKI). MicroRNAs, short non-coding RNAs, regulate key pathways implicated in SA-AKI pathophysiology.

This study aims to explore their potential as biomarkers in patients with early-stage SA-AKI in the emergency department (ED) and those with advanced disease in the intensive care unit (ICU). **Materials and Methods:** This is a post-hoc analysis of prospectively collected data. We utilized a hypothesis-driven panel of twelve microRNAs linked to sepsis, renal cell injury, and SA-AKI. Plasma samples were collected upon ED and ICU admission, analyzed for microRNA levels and normalized to the global mean. MicroRNA levels were compared across ED groups (no infection, sepsis, and SA-AKI) and ICU groups (sepsis and SA-AKI). Performance for SA-AKI differentiation and mortality prediction was assessed using odds ratios and area under the receiver operating characteristic (AUROC) analysis.

Results and Discussion: This study evaluated microRNA data of 193 ED patients categorized as non-infection (n=65), sepsis (n=67) and SA-AKI (n=61), and 47 ICU patients with sepsis (n=18) and SA-AKI (n=29). miR-21-5p was significantly upregulated in ED patients with SA-AKI and was associated with its occurrence (OR 2.28, 95% CI [1.40–3.73]; P<0.001).

Additionally, miR-21-5p demonstrated robust predictive value for in-hospital mortality, even after adjusting for age, sex, and disease severity (adjusted OR 3.42, 95% CI 1.69–6.94; P < 0.001), with an area under the curve (AUC) of 0.82 (95% CI 0.74–0.91; P < 0.001).

In the ICU population, miR-21-5p was the only microRNA significantly associated with SA-AKI (odds ratio [OR] 3.48, 95% confidence interval [CI] 1.27–9.53; P=0.02), achieving an AUC of 0.74 (95% CI 0.58-0.89). The modest performance of miR-21-5p and the overall lack of significant findings for the other microRNAs question the applicability of microRNAs as effective tools for early SA-AKI differentiation.

Conclusion(s): Our findings suggest that this microRNA panel has limited utility as biomarkers for SA-AKI in clinical settings. However, miR-21-5p may serve as a marker of overall disease severity, with potential predictive value for clinical outcomes in early patient presentations, particularly in initial presentations at the emergency department.

34AP02-7

Esophageal rupture secondary to vomiting with complicated hydropneumothorax: progression to septic shock and multiorgan failure

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Background: Esophageal perforation is a rare but potentially lifethreatening medical emergency. The diagnosis is a challenge and usually delayed given its multiple etiologies and varying clinical.

Case Report: A 72-year-old woman with no relevant medical history presented with right-sided thoracic trauma and progressive dyspnea over a few hours. She denied additional symptoms except for vomiting over the past week.

On examination, she was in good general condition with vital signs within normal ranges. A chest X-ray revealed a right hydropneumothorax, leading to the placement of a chest tube that drained purulent fluid. Her initial course was favorable, allowing the resumption of oral intake.

However, drainage of alimentary content through the chest tube raised suspicion of esophageal rupture, likely secondary to vomiting (Boerhaave syndrome). A contrast-enhanced chest CT confirmed distal esophageal perforation with communication to the right pleural cavity. A second chest tube was inserted, and an esophageal stent was placed. Despite these measures, her condition deteriorated, progressing to septic shock and acute respiratory distress syndrome (ARDS).

An emergency thoracotomy was performed with pleural cavity irrigation. Despite intensive resuscitative efforts, including broad-spectrum antibiotics, renal replacement therapy, fluid resuscitation, and vasoactive drugs, the patient developed multiorgan failure and deceased.

Discussion: Half of esophageal perforations are iatrogenic and 15 percent are spontaneous or secondary to Boerhaave syndrome. This syndrome is associated with high morbidity and mortality and is fatal in the absence of therapy. The nonspecific symptoms may contribute to a delay in diagnosis and a poor outcome.

Thus, timely diagnosis and initiation of treatment is of essence. Management include fluid resuscitation, broad-spectrum antibiotics, repair and dranaige of any collection and nutritional support. The principal variables associated with mortality from an esophageal perforation include delay in diagnosis, type of repair, location of perforation, and etiology of the perforation.

Learning points: Complications of esophageal perforation can be severe, so early diagnosis and aggressive management are key to prevent fatal outcomes.

Clinical suspicion play an important role because of the rarity of esophageal perforation and the variability in clinical presentation.

Efficacy of MR-proADM and other biomarkers as early predictors of disease severity and mortality in patients with severe infection in ICU: preliminary results from a multicenter prospective observational study

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Background: Proadrenomedullin (pro-ADM) is a peptide expressed in various tissues upregulated by hypoxia, inflammatory cytokines, bacterial products and shear stress. Its precursor mid-regional pro-ADM (MR-proADM) is an effective and early biomarker of endothelial damage correlate, particularly promizing in sepsis¹, not already studied in Intensive Care Units.

Goal of Study: To evaluate MR-proADM for 28 days mortality compared to other inflammatory biomarkers in severe infections requiring ICU-admission.

Materials and Methods: prospective observational 2 centers study, including ICU-patients admitted for severe infections between December 2022 and June 2024. Continous variables were analyzed with t-test or Wilcoxon test, dicotomic variables were analyzed with Fisher or Chi-squared test.

Results and Discussion: 92 patients were enrolled. Mean SOFA and SAPSII values were 9 and 48, respectively. Sepsis and septic shock were reported in 76% and 95% of patients, respectively. Infections were microbiologically confirmed in 87% of patients (infection type: respiratory 38%, intraabdominal 38%, genitourinary 6.5%). 28-days and ICU-mortality were 33 and 29%. respectively. Among the scores, only the SAPSII was statistically different between the two groups (p-value 0.0148). All standard biomarkers (C-RP, PCT, lactate) failed to show statistical significance for primary outcome. MR-proADM value at ICU admission showed significant difference (p 0,0011). MR-proADM values at day3 (p 0,0126) and day7 (p 0,0010) from admission also showed significant difference. Lymphocyte count showed statistical difference at admission (p 0,0009), at day3 (p 0,0007) and day7 (p 0,0015). Although a decreasing trend seemed to carachterize survivors and increasing trend non-survivors patients, MR-proADM trend during time failed to show statistical significance.

In multivariate analysis, MR-proADM failed to show statistically significant difference (OR 1.075, CI 0.968-1.193, p 0,1748), as opposed to immunosuppression (OR 7.783, CI 1.504-40.269, p 0.0144), age (OR 1.048, CI 1.004-1.093, p 0.0305) and lymphocyte count at admission (OR 0.997, CI 0.993-1, p 0.0445).

Conclusions: In ICU-severe infections, MR-proADM values at admission and during ICU stay seems to correlate with 28 days mortality, suggesting a role for this biomarker in predicting disease severity. Further data are needed to corroborate our findings.

Reference

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34AP02-9

Associations between pre-operative iron deficiency and postoperative infection in patients undergoing major surgery (CARIPO): a prospective observational study

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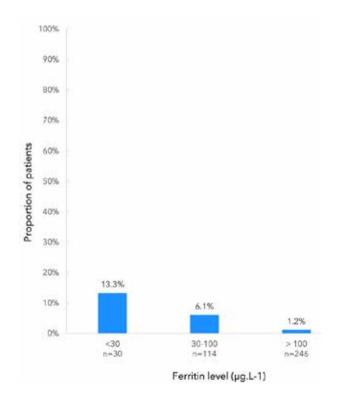
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Background and Goal of Study: Iron deficiency, with or without anaemia, is common during the peri-operative period. It has been hypothesised that pre-operative iron deficiency is associated with an increased incidence of postoperative infection. We designed the CARIPO prospective observational study to assess the incidence of postoperative infection in patients with and without iron deficiency undergoing a variety of major surgeries.

Materials and Methods: We conducted a single-centre study in a tertiary, university-affiliated hospital in France. Iron deficiency was defined as a ferritin < 100 μ g.l⁻¹ or < 300 μ g.l⁻¹ with a transferrin saturation < 20%.

The primary outcome was incidence of any postoperative infectious complication measured at 90 days after surgery. Secondary endpoints included the incidence of individual infectious complications: surgical site infection; bacteraemia; pneumonia; urinary tract infection; peripheral line-associated bacterial infection; and all-cause postoperative complication.

	Iron deficient	Iron replete	р
A	(n=170)	(n=220)	value
Any postoperative infectious complication	27 (16%)	26 (12%)	0.25
Main type of infections			
Surgical site infection	11 (7%)	3 (1%)	0.01
Urinary	2 (1%)	4 (2%)	0.70
Pulmonary	5 (3%)	11 (5%)	0.44
Catheter	7 (4%)	5 (2%)	0.38



Results and Discussion: We recruited 390 patients. Of these, 170 (44%) had pre-operative iron deficiency and 220 (66%) were iron replete: 27 (16%) patients in the iron deficient group developed a postoperative infection compared with 26 (12%) in the iron replete group (p = 0.25). Surgical site infections occurred in 11 (7%) iron deficient patients and 3 (1%) iron replete patients (p = 0.01). Other types of infectious complication and all-cause postoperative complication were similar between groups.

Conclusion: Iron deficiency was not associated with a higher rate of postoperative infection relative to an iron replete state. While iron deficiency was associated with a higher rate of surgical site infection, this result is hypothesis-generating, and further prospective studies are required.

34AP02-10

A novel approach to predict the need for hemodynamic support therapy in sepsis: pulse oximetry plethymography in the emergency department

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Background: Sepsis is the leading global cause of mortality, with septic shock mortality exceeding 40%. Hemodynamic instability in sepsis requires timely treatment to prevent organ failure. Current resuscitation strategies apply a one-size-fits-all approach, risking fluid overload or prolonged shock. Personalized approaches integrating macro- and microvascular changes could improve outcomes. Pulse oximetry photoplethysmography (PPG), a noninvasive technique measuring blood volume changes, may assess these changes. This study evaluates associations between PPG features measured during emergency department (ED) triage and vasopressor therapy within 24 hours in sepsis patients.

Methods: A secondary analysis of the Acutelines biobank included 325 sepsis patients requiring ED hemodynamic resuscitation. Pulse oximetry PPG waveforms from the first 20 minutes of ED admission were preprocessed and analysed. Principal component analysis (PCA) reduced dimensionality, and k-means clustering categorized patients into three clinical clusters. Multivariable logistic regression explored associations between PPG components and outcomes, with predictive performance evaluated through ROC analysis.

Results: Among 325 patients, 15.4% required vasopressors within 24 hours. PCA identified three components explaining 80.31% of variance. Clustering revealed three groups with distinct clinical characteristics. Cluster C had severe hemodynamic instability, elevated lactate, and higher rates of vasopressor use, ICU admission, and mortality. PPG components predicted vasopressor therapy within 24 hours, with an AUROC of 0.740, PPV of 0.927, and NPV of 0.346.

Conclusions: PPG features measured at triage provide valuable insights into sepsis-related macro- and microvascular changes, offering prognostic value for vasopressor therapy within 24 hours of ED admission. These findings support pulse oximetry PPG as a potential tool in developing personalized hemodynamic resuscitation for sepsis.

34AP02-11 Fever of unknown origin

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Background: Thermoregulatory centre, located in the hypothalamus controls our body temperature and could be damaged by pyrogenic cytokines, pyrogens, as a response to inflammation and infection. Regardless of fever is inflammatory reply amplifying the immunological response, high fever may harm patient [1].

Case Report: 58-year-old female patient weighs 135 kg, has breast cancer (right mastectomy), dementia, DM, CRF, HT, she is paraplegic care patient due to previous CVA. The patient had obesity surgery, has a port, she had been treated with antibiotics for urinary tract infection. She applied to our hospital with poor general condition, drowsiness, and fever, infection scan was performed (blood culture from port and peripheric ven). An increased opacity was seen on the base in the chest X-ray, atelectasis? Infiltration? aspiration pneumonia? Tazocin treatment was started. Staphylococcus hominis was seen in the blood culture sent from the port, vancomycin was added. Although the patient remained afebrile for the next 2 days, fever was seen again on the 3rd day. The patient underwent an echocardiogram, no vegetation was seen. The patient's port catheter was surgically removed. Contrast-enhanced thorax and abdomen CT was performed, the sigmoid colon showed an advanced redundant course, wall thickening reaching 2 cm and gas-stool distension were seen in the thickest part of the long segment of the distal descending colon, sigmoid colon and rectum. The patient underwent rectosigmoidoscopy, the patient's colon biopsy result was reported as pseudomembranous colitis. CMV excluded as CMV IgM was negativ. Tigecycline and flagyl treatment was completed in 7 days.Oral vancomycin and candisept were continued for 14 days.

Discussion: In our country, the most common cause of fever of unknown origin is infectious diseases. When routine tests and cultures do not yield results, further examinations and imaging should be considered [2].

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Learning points: When investigating the etiology of fever, it should be remained that pseudomembranous colitis may occur in patients receiving long-term antibiotic treatment even in the absence of diarrhea.

Treatment of anaerobic infection in a patient with a mine blast trauma (MBT)

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Background: Anaerobic infection is a severe wound infection caused by anaerobic microorganisms. Patients with anaerobic infection have high mortality rate[1]. This clinical case describes the diagnosis and treatment of anaerobic infection in injured combatant.

Case Report: A soldier was hospitalized with a diagnosis of mine blast trauma (MBT), gunshot wound to the left lower leg with a fracture of the tibia and fibula and a massive soft tissue defect in the left lower limb, injuries received during military operation. Patient underwent a Free Thoracodorsal Artery Perforator Flap (TDL) for the defect in the left tibia. Day1 after surgery patient deteriorated. On examination: thrombosis of the thoracodorsal artery and the TDL flap was removed. On Day2 patient unstable, on high doses of noradrenaline(≈ 0,4 mg/h). On CT - signs of subcutaneous and intermuscular emphysema of the right chest wall with spread to mediastinum, and presence of gas bubbles on the surface of the rhomboid major muscle. The lateral surface of the chest, the muscle tissue have dark color and is necrotic. On Day3 patient in septic shock, on mechanical ventilation (MV) (pressure control ventilation (PC) with FiO2 - 40%), hemodynamics was maintained by noradrenaline ≈ 0,54 mg/h. In wound culture - anaerobic infection - Clostridium perfringens sensitive to Linezolid, so antibiotic therapy was adjusted accordingly. Hyperbaric oxygen therapy (HBO) was not available. Patient required MV till Day15. He received daily wound care with necrotectomy and later, application of amniotic membrane to the rib area of the lateral surface of the trunk and subsequent autodermoplasty of the lateral surface of the trunk and lower leg. Patient was successfully discharged from the hospital on Day40.

Discussion: Sepsis and septic shock caused by anaerobic infection are critical conditions. Combatants are under the risk because of prolonged evacuation time between injury and medical care. Anaerobic infection is causes high mortality in Ukraine and the world, especially in countries with a military conflicts[2].

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Learning Points: Timely diagnostics of wound infection is crucial for appropriate treatment of patients with MBT. Properly selected antibiotic therapy and daily surgical wound care have improved patient outcome.

34AP03-2

Extracellular vesicle mir150-5p as a biomarker for optimizing clinical management of sepsis and septic shock: a discovery and validation study

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Background and Objectives: Sepsis and septic shock are significant contributors to mortality among surgical patients. The role of extracellular vesicles (EVs), particularly their primary content of microRNAs (miRNAs), has surfaced as a pivotal factor in the detection and understanding of these conditions. EVs-derived miRNAs have advantages over plasma miRNAs, such as a better diagnostic performance in some cases3. Thus, the purpose of this study was to analyze the profile of circulating plasma-derived EVs miRNAs in patients with sepsis and septic shock to identify differential biomarkers that can facilitate the management of these patients.

Methods: A multicentric study was conducted in 100 patients who were followed prospectively, 58 developed septic shock and 42 developed sepsis. EVs-derived miRNAs were isolated and massively sequenced to identify differentially expressed miRNAs between groups. Predictive performance was evaluated through area under curve values (AUC) using receiver operating curves (ROC). An additional validation cohort of septic shock patients (n=33) and sepsis patients (n=33) was used to validate our EVsderived miRNA results. Furthermore, we compared our data with an external cohort of plasma miRNA data.

Results: 18 SDE EV-miRNAs were identified between the two groups of patients. A total of 15 miRNAs were upregulated in septic shock patients and 3 were downregulated. Six EV-miRNAs had a good ability to predict septic shock. Low levels of hsa-miR-150-5p showed the best ability to predict septic shock (AUC: 0.852; 95% CI: 0.75-0.96; p<0.001) with a sensitivity of 86.96% and a specificity of 78.72%. The association of hsa-miR-150-5p with septic shock was validated in the validation cohort and confirmed its presence in plasma via qPCR.

Cconclusion: In conclusion, hsa-miR-150-5p levels exhibit a significant differential expression between patients with septic shock and those with sepsis without shock. This biomarker can aid physicians in managing post-surgical patients with sepsis. Furthermore, its integration into clinical laboratories is feasible, as PCR - a rapid, accurate, and routinely used technique - facilitates efficient detection.

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Navigating anaesthetic challenges of C1 esterase inhibitor type 1 patient during emergency dental extraction under conscious sedation: a case report

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Background: Hereditary angioedema (HAE), a rare disorder causing recurrent angioedema, poses significant perioperative challenges due to potential airway compromise from excessive bradykinin production. This case report details the successful management of an HAE type 1 patient undergoing emergency dental extraction under conscious sedation. Its significance lies in demonstrating effective multidisciplinary care, including proactive prophylaxis and careful sedation techniques, despite the patient's complex history and needle phobia, offering valuable insights into emergency management.

Case Report: A 24-year-old male with hereditary angioedema (HAE) type 1 presented with an acutely infected impacted mandibular molar, triggering facial angioedema. His HAE was diagnosed at age 8, with previous management including tranexamic acid and icatibant. He subsequently transitioned to Berotralstat, though adherence to scheduled appointments remained challenging due to needle phobia. The preoperative assessment revealed borderline elevated C-reactive protein, absent complement C4 and significantly reduced C1-INH antigen and function. Prophylactic intravenous C1-INH (1000 units) was administered 24 hours and 20 minutes prior to the procedure. Conscious sedation (midazolam, fentanyl, propofol) and local anaesthesia facilitated the uneventful extraction. Postoperatively, the patient experienced only mild facial flushing.

Discussion: This case highlights the successful perioperative management of an HAE patient undergoing an emergency dental procedure. Prophylactic C1-INH effectively prevented acute angioedema. The choice of conscious sedation minimized the risk of airway compromise, a crucial consideration given the patient's HAE. This successful outcome underscores the importance of proactive, individualized treatment plans and close monitoring in patients with HAE, particularly in emergencies. Further research is warranted to optimize management protocols for such scenarios.

Learning points: Successful perioperative management of hereditary angioedema (HAE) requires a multidisciplinary approach incorporating prophylactic C1-INH to prevent acute attacks, conscious sedation to minimize airway risk, and individualized care plans addressing patient-specific factors such as needle phobia. Patient education is critical for treatment adherence and optimal outcomes.

34AP03-4

Organ/space nosocomial infection after elective colorectal surgery: a retrospective analysis of microbiology and antibiotic coverage

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Background and Goal of Study: organ-space infection (OSI) is a common complication after colorectal surgery, including anastomotic leakage and intra-abdominal abscesses. Prompt and effective treatment is critical to patient prognosis, and appropriate antibiotic therapy is essential. Knowing the microbiology of OSI at each center is key for optimal treatment. The aim of this study was to describe the most prevalent microbiology in our center and analyze antimicrobial sensitivity to three empirical antibiotic therapies.

Materials and Methods: after ethics committee approval, we retrospectively analyzed cultures of OSI cases following elective colorectal surgery over the past 10 years (2014-2023) in our hospital. Results were categorized into nine groups: extendedspectrum beta-lactamase (ESBL)-producing enterobacteriaceae, Pseudomonas spp, other Gram-negative bacilli (GNB), Enterococcus faecium, methicillin-resistant Staphylococcus aureus (MRSA), other Gram-positive cocci (GPC), anaerobes, polymicrobial flora, and fungi. Using this data, we explored the microbiological coverage of three empirical antibiotic regimens: Amoxicillinclavulanate. Piperacillin-tazobactam, and Meropenem+Linezolid Results and Discussion: of 1,334 colorectal surgeries performed, 99 (7.4%) developed OSI, and 77 had positive cultures. The microbiological results were:

- Pseudomonas spp.: 13%
- ESBL enterobacteriaceae: 7.8%
- Other GNB: 66%
- Ampicillin-resistant E. faecium: 33.7%
- MRSA: 1.3%
- Other GPC: 50.6%
- Anaerobes: 26%
- Polymicrobial flora: 8%
- Fungi: 20.8%

Taking into account the bacterial growth, the following percentages of patients would have been adequately covered by each antibiotic regimen:

- · Amoxicillin-clavulanate: 49%
- Piperacillin-tazobactam: 61%
- Meropenem + Linezolid: 93.5%

Notably, 20% had fungal isolation (Candida spp.), which would not be covered by any empirical therapy without adding antifungal treatment. Moreover, 32% of Candida isolates were resistant to fluconazole.

Conclusion(s): GNB, non-resistant GPC and anaerobes were the most frequent pathogens but ampicillin-resistant E. faecium, Pseudomonas spp., and ESBL-producing bacteria were also significant. Amoxicillin-clavulanate covered 49% of positive cultures, piperacillin-tazobactam increased sensitivity to 61% and Meropenem+Linezolid covered nearly all patients. Fungi (Candida spp.) were found in 20% cultures. Empirical antifungal therapy should be considered when OSI is suspected.

Septic shock of prostatic origin with immediate postoperative onset in the PACU - a case report

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Background: Transurethral resection of the prostate (TURP) is performed in a semi-sterile environment. Thus, urinary tract infections (UTI) are common complications (1). Progression to septic shock is rare and can develop insidiously (2).

Case Report: 75-year-old male, ASA III, with prostatic adenocarcinoma, set for elective TURP. History included severe obstructive sleep apnea, grade II hypertension, dyslipidemia, grade II obesity, and stable coronary artery disease. ASA monitoring standards were followed and urinary catheterization was established. Subarachnoid block was performed (8 mg 0.5% levobupivacaine, 2.5 mcg sufentanil, paramedian approach at L3/L4), followed by the administration of 2 g cefoxitin. Surgery lasted 1h20min with mild sedation applied (50 mg propofol, 20 mg ketamine). In the perioperative period, the patient kept hemodynamically stable, apyretic, with SpO2 >95% under O2 therapy with nasal cannula (3 L/min). One hour after surgery, in the PACU, the patient was sub-febrile, hypotensive, tachycardic, tachypneic, and without urinary output via Foley catheter. Physical examination revealed abdominal distension, tympany, diffuse pain, and abdominal guarding. Arterial blood gas showed hyperlactatemia (4.9 mmol/L). CT scan and angio-CT of the thorax, abdomen, and pelvis excluded perforation and bleeding. Empirical antibiotic therapy initiated (piperacillintazobactam, gentamicin). The patient was diagnosed with septic shock (prostatic origin) and transferred to the ICU, with invasive blood pressure monitoring and a central venous catheter in place for vasopressor support.S. hominis was isolated from cultures. The patient progressed favorably.

Discussion: UTIs are common complications after TURP and typically develop insidiously. Risk factors such as patient comorbidities and prostatic adenocarcinoma may have contributed to the onset of septic shock.

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Learning points: It is important to quickly recognize and manage septic shock. Clinicians should keep a high index of suspicion with patients undergoing TURP.

34AP03-6

Limited utility of red cell distribution width in predicting post-surgical infectious complications

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Background and Goal of Study: Red Cell Distribution Width (RDW) measures the variability in red blood cell volume and is raised in conditions associated with chronic inflammation and oxidative stress. These factors may predispose surgical patients to postoperative infectious complications. We thus hypothesized that RDW might have utility in preoperative risk assessment of patients scheduled for elective surgery.

Materials and Methods: The study was conducted in a single tertiary center in the Netherlands. Consecutive patients undergoing elective, non-cardiac, non-intracranial intermediate- to high-risk surgery in an inpatient setting between 2012 and 2023 were included. The primary study outcome was all-cause infection occurring up to postoperative day 14. First, a core model was fitted including 13 known predictors of infection using logistic regression with backward covariate selection. The added predictive value of RDW was subsequently assessed by using Akaike's Information Criterion (AIC), and by comparing predictive performance of this core model to an extended model that included RDW, considering discrimination, calibration, overall accuracy, reclassification, and decision curve analysis.

Results and Discussion: A total of 14.165 patients undergoing 16,279 procedures were analyzed, of which 2561 (15.7%) were followed by postoperative infection. The core model demonstrated a c-statistic of 0.73 (95% CI 0.72 to 0.74). By contrast, univariable logistic regression analysis yielded a c-statistic of 0.60, indicating limited predictive accuracy of RDW for postoperative infection. Although extending the core model with RDW improved model fit based on the AIC, it did not result in meaningful improvements in predictive performance or reclassification (c-statistic 0.73, Integrated Discrimination Improvement = 0.0017, Net Reclassification Index = 0.006). Decision curve analysis further confirmed that there was no clinically relevant difference between the two

Conclusion(s): RDW did not improve the preoperative prediction of infectious complications after elective intermediate- to-highrisk inpatient surgery compared to a core model incorporating a comprehensive set of clinical predictors.

Prediction of mortality and correlation with APACHE II of fibrinogen/albumin, CRP/albumin, BUN/albumin, and lymphocyte/monocyte ratios measured in the first 24 hours in non-traumatic septic patients

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Background and Goal of Study: Sepsis is an organ dysfunction caused by an inappropriate host response to infection, with a 20-50% mortality rate. It is important to estimate the prognosis in sepsis. This study aimed to evaluate the success of some markers in predicting mortality in sepsis.

Materials and Methods: This study was planned retrospectively in 100 non-traumatic patients over the age of 18 who were admitted to İzmir Kâtip Çelebi University Atatürk Training and Research Hospital Anesthesia intensive care unit between 01/01/2021 and 21/09/2023 with the diagnosis of Sepsis. The patients' age, gender, chronic diseases, reason and date of intensive care admission, intensive care discharge type, intubation and inotropic support status were obtained from the hospital system. Arterial pH, PaCO2, PaO2, albumin, C-reactive protein, fibrinogen, procalcitonin, D-dimer, sodium, potassium, serum creatinine, blood urea nitrogen, hematocrit, leukocytes, lymphocytes, monocytes, platelets and GCS value at admission to intensive care were recorded. Afterwards, FAR (fibrinogen/albumin), CAR (CRP/albumin), BAR (BUN/albumin), LMR (lymphocyte/monocyte), APACHE-II score and Glasgow prognostic score were calculated and the relationship of these rates with mortality and correlation with APACHE-II were evaluated.

Results and Discussion: Of the 100 patients included in the study, 35% were female and 65% were male. The mean age of the patients was 69.81±13.97. 62% of the patients died. In the single logistic regression analysis performed for the effect of GKS. APACHE-II, GPS, FAR, CAR, BAR and LMR values on mortality, GKS, APACHE-II scores and BAR values were found to be statistically significant (p<0.05). In the multivariate analysis performed, only APACHE-II scores were found to be significant (p=0.019). In the ROC analysis performed, the AUC values of GKS, APACHE-II and BAR values were found to be significant and it was determined that APACHE-II had the highest predictive power for mortality.

Conclusion(s): In our study, the highest predictive markers for mortality in Sepsis were determined to be APACHE-II (70%), GKS (65%) and BAR (64.5%), respectively. In the evaluation of the mortality status of Septic patients admitted to the ICU; We concluded that various situations such as invasive mechanical ventilation and inotropic support should be evaluated at the time of admission, and that various scores and biomarkers can guide the clinician.

34AP03-8

Nocardia infection: a rare case report of a cerebellar mass

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Background: Nocardia otitidiscaviarum infections are rare, particularly those involving the central nervous system (CNS).1 Such infections are challenging to diagnose and treat, especially in immunocompromised patients. This case highlights Nocardia sp cerebellar abscess in a patient with relapsed multiple myeloma. emphasizing the diagnostic challenges and management strategies.2

Case Report: A 53-year-old man with relapsed IgA Kappa multiple myeloma presented with altered consciousness and ataxia. His condition was complicated by multiple relapses and previous treatments including autologous stem cell transplantation and ongoing salvage therapy leading to suspicion of posterior circulation ischemic stroke. CT brain imaging revealed a left cerebellar mass with hydrocephalus. Initial cerebrospinal fluid analysis and cultures were inconclusive. Excision biopsy identified Nocardia otitidiscaviarum. Initial treatment included intravenous imipenem and bactrim, followed by a prolonged course linezolid and adjunctive bactrim. The patient experienced significant neurological recovery and a reduction in lesion size and eventually achieved stable neurological status upon discharge.

Discussion: Nocardia infections, although uncommon, are significant in immunocompromised patients due to diagnostic and therapeutic complexity. CNS involvement often mimics malignancies or other infections, delaying diagnosis. Neuroimaging plays a vital role, but definitive diagnosis relies on microbiological and histopathological findings. Treatment typically involves surgical excision combined with long-term antibiotic therapy. In this case, linezolid emerged as a critical option due to resistance patterns and treatment constraints. This report underscores the need for heightened clinical suspicion and a multidisciplinary approach in similar scenarios.

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- 2. Beaman, B.L. & Beaman, L., 2019. Nocardia infections in immunocompromised patients. Journal of Infectious Diseases, 210(4), pp.528-532.

Learning points: Nocardia infections should be considered in differential diagnoses for cerebellar masses, especially in immunocompromised patients. Neuroimaging and histopathological findings are crucial for diagnosis.

Surgical intervention combined with tailored long-term antibiotic therapy can yield favorable outcomes

34AP03-9 Post epidural paravertebral phlegmon: a case report

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Background: Epidural phlegmon (EP) is a rare complication of epidural catheter insertion. The typical presentation includes fever, back pain, and antalgic gait. Late diagnosis or inadequate treatment may lead to severe long-term incapacity. We present a case of paravertebral phlegmon post-epidural block in an elderly patient.

Case Report: A 76-year-old patient, ASA II, underwent total knee arthroplasty under combined spinal-epidural anesthesia. The procedure was performed under aseptic conditions without immediate complications. The epidural catheter was removed on postoperative D3. On D20, she reported newly onset back pain unresponsive to oral analgesics, with no neurological deficits or fever. Examination revealed a 4-centimeter reddened, edematous, and painful area. CT imaging showed cellulitis and paravertebral myositis at L2-L3, with possible intervertebral phlegmon. She was admitted for empiric antibiotic treatment with ceftriaxone and vancomycin. Blood cultures were negative, and a control MRI on the 5th day showed shrinking of the paravertebral collection and signs of acute osteomyelitis in the spinous processes. Ten days later, the pain subsided, inflammatory markers normalized, and the patient was discharged home to complete a month of antibiotics. During follow-up, she reported no lumbar pain or infection recurrence.

Discussion: This patient had no risk factors for post-epidural paravertebral phlegmon, such as systemic infection, compromised immunity, challenging puncture or prolonged epidural catheterization. Preventive measures during puncture were followed, including hand disinfection, sterile attire, applying 0.5% chlorhexidine skin spray and allowing it to dry, as the latest guidelines recommend. It is crucial to remain vigilant after any neuroaxial approach. This case also highlights the rapid progression of EP and the importance of early radiological diagnosis for timely treatment. EP without neurological deficits can be managed with antimicrobial therapy alone, as in this patient. While surgical intervention was avoided, we emphasize the importance of monitoring for neurological decline that could signal the failure of medical treatment.

Learning points: Aseptic conditions must always be maintained when performing a neuraxial technique. In all patients submitted to neuraxial analgesia, a high level of suspicion for EP should be maintained when symptoms arise, and prompt treatment should be administered to prevent further complications.

34AP03-11

Cerebral abscess revealing nocardiosis in a patient with systemic lupus erythematosus: a challenging diagnosis

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Background: Nocardiosis is a rare opportunistic infection caused by the gram-positive bacterium Nocardia, primarily affecting immunocompromised individuals. Its clinical presentation is highly variable, ranging from pulmonary to disseminated infections, including cerebral abscesses. Diagnosing nocardiosis is challenging due to its rarity, non-specific symptoms, and difficulty in pathogen isolation. This case highlights the diagnostic and therapeutic complexities of nocardiosis in a patient with systemic lupus erythematosus (SLE) and cerebral abscesses.

Case Report: A 29-year-old woman with a 9-year history of SLE on corticosteroid and hydroxychloroquine therapy presented with left-sided hemiparesis and fluctuating cutaneous lesions unresponsive to empirical antibiotics. She developed severe headaches and dysarthria. A brain CT scan revealed multiple abscesses with hydrocephalus (Figure 1). Initial treatment included external ventricular drainage and broad-spectrum antibiotics. Despite these measures, her condition deteriorated, necessitating surgical drainage. Prolonged cultures identified Nocardia farcinica. Treatment was adjusted to trimethoprim-sulfamethoxazole and amikacin. Subsequently, the patient developed a subcutaneous abdominal abscess requiring surgery. Despite aggressive medical and surgical interventions, she succumbed to septic shock and multiorgan failure on the 20th day of hospitalization.

Discussion: Nocardiosis is rare but increasingly recognized in immunocompromised patients, with SLE being a significant risk factor (1). CNS involvement occurs in 20-44% of cases, with mortality rates exceeding 50% in disseminated forms (2). Diagnosis often requires invasive sampling and prolonged culture incubation, with molecular tools like metagenomic sequencing emerging as faster alternatives (3). Therapy typically involves trimethoprimsulfamethoxazole, often combined with other agents for severe cases. Despite timely treatment, mortality remains high, emphasizing the need for early suspicion and intervention.

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Mycotic aneurysm of the abdominal aorta secondary to Salmonella infection: a case report

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Background: Infectious aneurysms are rare but are associated with high morbidity and mortality due to nonspecific clinical manifestations, rapid growth and the urgent need for treatment caused by the potential rupture of the arterial wall.

Case Report: A 55-year-old man presented two months of lumbar pain and a 72-hour fever. Laboratory tests revealed leukocytosis and elevation of CRP and procalcitonin. CT imaging showed a saccular aneurysm of the infrarenal abdominal aorta (45x44x45mm) and a lesion in the left kidney.



Empirical antibiotic therapy with meropenem and daptomycin was initiated. Surgery included aorto-aortic bypass, left nephrectomy and cholecystectomy, revealing perforated purulent aortitis contained and aorto-enteric fistula. Blood cultures identified Salmonella D and ascitic fluid cultures showed Enterococcus durans. Candida albicans and Salmonella D. Anidulafungin was added to the treatment.

In the first few days postoperatively, the patient developed septic shock (SOFA score 14). A laparotomy revealed diffuse peritonitis, retroperitoneal hematoma, duodenal perforation and necrotizing pancreatitis. An aortic endoprothesis and a pericardial patch for the duodenal perforation were placed. A postoperative biliary fistula required external biliary drainage.

Discussion: The infrarenal segment of the aorta is the most commonly affected site1. The infectious aneurysms are categorized into four types: mycotic, microbial arteritis, infection in pre-existing aneurysms and infected post-traumatic false aneurysms. For diagnosis CT is the imaging test of choice complemented by microbiological testing². Treatment combines surgical repair and antimicrobial therapy.

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- 2. Pérez Burkhardt, J. Aneurismas micóticos: particularidades diagnósticas y de tratamiento. Angiología. 2015;68(1):46-54.

Learning points:

- Diagnosis requires clinical suspicion, imaging and microbiological isolation.
- Management involves urgent surgery and prolonged antimicrobial therapy.
- In the presented case, complications like peritonitis, septic shock and duodenal fistula prolonged recovery.

34AP04-1

Proteomic analysis approaching sepsis-induced diaphragm atrophy

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Background: Sepsis-induced diaphragm atrophy increases ventilator dependency and mortality. While mitochondrial dysfunction is a key factor, other mechanisms remain unclear. This study employed proteomic analysis to investigate these processes.

Materials and Methods: Polymicrobial sepsis was induced in male C57BL/6 mice using cecal ligation and puncture (CLP). Diaphragm samples were collected 7 days post-CLP for histological and proteomic analyses.

Results and Discussion: Histological analysis confirmed diaphragm atrophy with reduced muscle bundle cross-sectional area (p = 0.010) and increased bundle density (p = 0.006) (Fig. 1).

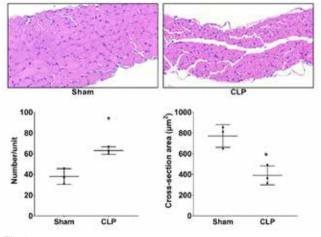
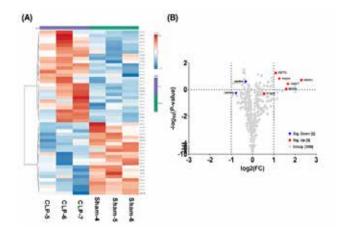
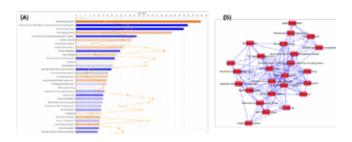


Fig. 1

Proteomic analysis revealed 379 differentially expressed proteins between CLP and Sham groups (Fig. 2A). A volcano plot highlighted key proteins with significant fold changes (Fig. 2B).



Pathway analysis indicated upregulation of mitochondrial dysfunction (oxidative phosphorylation, respiratory electron transport), metabolic pathways (fatty acid oxidation, glycolysis), and neutrophil signaling (extracellular trap formation, degranulation, granzyme A activity) in CLP mice (Fig. 3A). These interconnected pathways suggest mitochondrial, metabolic, and immune responses as drivers of diaphragm atrophy (Fig. 3B).



Conclusion: Pathways related to mitochondrial dysfunction, metabolic processes, and neutrophil signaling contribute to sepsisinduced diaphragm atrophy, providing potential targets for therapeutic intervention.

Acknowledgements: This study is party supported by Taipei Municipal Wanfang Hospital grant (grant no. 113-wf-eva-25).

34AP04-3 Foodborne botulism intoxication treatment-case report

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Background: Botulism is rare and potentially life-threatening neuroparalytic syndrome caused by a toxin, produced by the bacterium Clostridium botulinum. This syndrome courses initially with symmetrical cranial nerve palsy and may progress to descending flaccid paralysis and ultimately to respiratory arrest.

Case report: A 42-years old female is admitted in the emergency department with history of headache, nausea, vomiting, double vision, dysphagia, dysarthria and gait abnormalities. Shortly after admission her mother and sister were reported with similar symptoms. Upon arrival the patient is conscious. During physical examination dysphonia, dysarthria, ophthalmoparesis were observed. No data for meningo-radicular irritation. Based on the history of homemade canned egg-plant consumption food botulism intoxication was hypothesized.

The patients rapidly deteriorated with hypotension, worsening of the flaccid palsy, dysarthria and dysphagia and respiratory failure developed, which lead to ICU admission, early tracheostomy and mechanical ventilation. The neurotoxin was not isolated from blood or faeces. The can was tested and Clostridium botulinum was isolated, which confirmed the diagnosis.

The treatment included heptavalent antitoxin immunoglobulin, antibiotics, symptomatic medications, volume management and physical rehabilitation. The three patients evolved favorably with total functional recovery.

Discussion: Botulism is a rare yet life-threatening syndrome which should be suspected on a patient who develops acute and afebrile symmetric cranial nerve palsy, typically bulbar palsies, followed by symmetrical flaccid palsy of volunteer muscles and engaging the respiratory muscles resulting I respiratory failure. The botulism diagnosis is based on clinical presentation and epidemiological context.

Reference:

Foodborne botulism-two case reports https://jmedicalcasereports.biomedcentral.com/articles/10.1186/s13256-017-1523-9 https://pmc.ncbi.nlm.nih.gov/articles/PMC7846414/

Learning points: Botulism is rare, yet deadly syndrome affecting all ages which can be successfully treated by immediate antitoxin administration when diagnosed promptly. The disease should be taken under consideration in the differential diagnosis when flaccid palsy with cranial nerve engagement is observed along with basilar occlusion syndrome, excluded by the clinical evolution and imaging techniques and other neurological condition such as Guillain-Barré syndrome, Myasthenia gravis.

34AP04-4

Effects of hemoadsorption therapy on short-term mortality and vasopressor dependency in severe septic shock with acute kidney injury: a retrospective cohort analysis

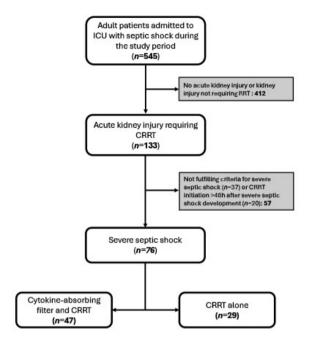
D. Epstein^{1,2}, K. Badarni¹, Y. Bar-Lavie^{1,2} ¹Rambam Health Care Center, Critical Care Division, Haifa, Israel, ²Technion, Ruth and Bruce Rappaport Faculty of Medicine, Haifa, Israel

Background and Goal of Study: Sepsis, a life-threatening condition resulting from a dysregulated immune response to infection, continues to pose significant challenges in intensive care units (ICUs). This study investigates whether the combination of hemoadsorption therapy and continuous renal replacement therapy (CRRT) can reduce ICU and short-term mortality in patients suffering from severe septic shock and acute kidney injury (AKI) requiring CRRT.

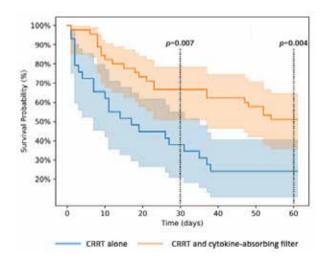
Materials and Methods: A retrospective cohort study was conducted at Rambam Health Care Campus in Haifa, Israel, between January 2018 and February 2024. The study included ICU patients with severe septic shock and AKI requiring CRRT. Patients were categorized into two groups: those treated with hemoadsorption therapy alongside CRRT and those treated with CRRT

alone. The primary and secondary endpoints assessed were ICU mortality, 30- and 60-day mortality, vasopressor dependency index (VDI), and lactate levels.

Results: Out of 545 patients with septic shock, 133 developed AKI requiring CRRT, and 76 met the inclusion criteria.



The hemoadsorption group (n=47) showed significant reductions in blood lactate levels and VDI after 24 hours compared to the CRRT alone group (n=29). ICU mortality was significantly lower in the hemoadsorption group (34.0% vs. 65.5%, p=0.008), as was 30 and 60-day mortality (34.0% vs. 62.1%, p=0.02 and 48.9% vs. 75.9%, p=0.002). Multivariate analysis confirmed hemoadsorption therapy as independently associated with lower ICU and 30-day but not 60-day mortality.



Conclusion: The combination of hemoadsorption therapy with CRRT in patients with severe septic shock and AKI requiring CRRT is associated with enhanced lactate clearance, decreased vasopressor requirements, and reduced ICU and 30-day mortality rates. High-quality randomized controlled trials are warranted to validate these results.

34AP04-5

Isolated hemadsorption with Oxiris as a new therapeutic option in management of two patients with refractory endotoxic shock

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Background: Oxiris as a hemofilter is traditionally used for adsorptive hemofiltration. However, its high immunoadsorption capacity allows to use it as an isolated hemadsorption device for endotoxin and cytokines clearance via a slow continuous ultrafiltration mode without fluid removal and under heparin anticoagulation. To date, no studies have reported the use of Oxiris in this modality for patients with septic shock.

Case Report: Two patients with Gram-negative septic shock were admitted to the Intensive Care Unit (ICU) following infection source control. Both had elevated inflammatory markers (interleukin-6 (IL-6) 399 and 162 pg/mL; procalcitonin (PCT) 11 and 22ng/mL; endotoxin 0.5 and 1.55 EU/mL), required high norepinephrine (NE) support (0.35 and 0.5µg/kg/min) and were refractory (defined as Dynamic Score System1 > 6 points in the first 12 hours) to standard treatment. As renal replacement therapy was not required, a 12-hour session of isolated hemadsorption with Oxiris was initiated to reduce the inflammatory response. Clinical improvements were observed after treatment: reduction in inflammatory markers (by 42% and 79%, 41% and 29%, 62% and 14% for IL-6, PCT and endotoxin, respectively) and NE support (by 63% and 22%). Neither patient had complications related to hemadsorption or required additional renal replacement therapy during treatment. They were discharged from the ICU on days 23 and 4 without the need for organ support therapy.

Discussion: Isolated hemadsorption with Oxiris may offer a therapeutic option for patients with refractory endotoxic shock by stabilizing the immune response and hemodynamics, thereby protecting against further organ damage. Tailoring the modality based on patient characteristics, such as the severity of the clinical course and renal function, could enhance the efficacy of immunoadsorption therapies and support their integration into clinical practice.

Reference:

Kogelmann, K et all. Evaluation of a New Dynamic Scoring System Intended to Support Prescription of Adjuvant CytoSorb Hemadsorption Therapy in Patients with Septic Shock. J. Clin. Med. 2021. doi.org/10.3390/jcm10132939

Learning Points:

- 1. Oxiris is traditionally used for renal function replacement and has potential for isolated hemadsorption due to its high immunoadsorption capacity.
- 2. Early and tailored use of isolated hemadsorption with Oxiris can stabilize hemodynamics and modulate immune response and prevent progression of multiple organ dysfunction.

34AP04-6

Predictive value of the heparin-binding protein (HBP) for mortality in patients with confirmed or suspected bacterial infection in ICU

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Background and Goal of Study: This study evaluated the relationship between Heparin binding protein (HBP) values and 28-day mortality in septic patients in the intensive care unit (ICU). It also compared HBP with other sepsis markers, white blood cell count (WBC), procalcitonin (PCT), and C-reactive protein (CRP), as well as the correlation between organ dysfunction (using the SOFA score) and mortality.

Materials and Methods: The prospective observational study included 41 adult surgical patients in the ICU who met SEPSIS-3 criteria. Inflammatory markers were measured at admission, 24, and 72 hours, SOFA and APACHE II scores were calculated accordingly.

Results and Discussion: HBP levels were significantly higher in non-survivors at all time points, particularly at 72h, where the levels were 86.17 \pm 11.73 compared to 42.85 \pm 10.49 in the survivors (p = 0.04). Conversely, HBP levels in the survivor group significantly decreased from admission to 72h, with initial values recorded at 73.6 ± 67.72 upon admission and dropping to 42.9 ± 56.24 by 72h (p = 0.03). These findings underscore the potential role of HBP as a biomarker for patient recovery. ROC analysis further substantiated the predictive capability of HBP for mortality. HBP values obtained at 48 hours could significantly forecast mortality, at a cutoff value of 63.48, HBP had an AUC of 0.739 (p = 0.02), a sensitivity of 69.2%, a specificity of 73.9%. SOFA score at 72 hours emerged as a significant predictor of mortality, with a cutoff value of 8.5, and an AUC of 0.77 (p = 0.01), yielding a sensitivity of 91.3% and a specificity of 69.2%. PCT levels assessed at 72h reinforced the significance of mortality prediction, at a cutoff of 1.85, PCT had an AUC of 0.781 (p = 0.01), a sensitivity of 78.3%, and a specificity of 76.9%. HBP at 48h also significantly correlated with PCT (r = 0.346, p = 0.01). In univariate analysis predicting ICU days, only HBP values at 48h were significant (β = 0.659, p = 0.01).

Conclusion(s): Assessing the dynamics of HBP and PCT within 72 hours of admission presents an insightful approach for predicting clinical outcomes in critically ill sepsis patients in the ICU. Adding HBP levels assessed at 48h to the SOFA score can serve as a valuable component to the prediction model and potentially enhance our understanding of patient prognosis. Our studies suggest that HBP could be an important early biomarker of organ dysfunction in the ICU.

34AP04-7

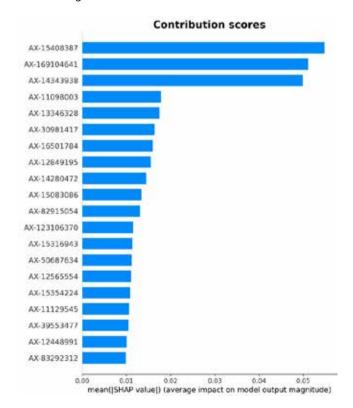
Identifying sepsis susceptibility genes using an artificial intelligence approach

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B. Martínez-Rafael^{1,2}, E. Gómez-Sánchez^{1,2},
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Background and Goal of Study: Early detection of sepsis is essential for its successful management. Although genome-wide association studies (GWAS) have shown potential in identifying sepsis-related genetic variants, they often involve heterogeneous patient groups and use single-locus analysis methods. We aimed to identify new sepsis susceptibility loci using an explainable artificial intelligence (XAI) approach applied to GWAS data.

Materials and Methods: GWAS was performed in 750 post-operative patients with sepsis and 3,500 population controls. We applied a novel XAI-based methodology to single nucleotide polymorphisms (SNPs) to predict sepsis and identify new genetic variants associated with sepsis susceptibility. We assessed functional and enrichment effects using empirical data from integrated software tools and datasets, with the top-ranked variants and associated genes.



Results and Discussion: Our XAI-GWAS approach showed an excellent performance in predicting sepsis, with an area under the receiver operating characteristics curve of 0.985, using 3,761 SNPs with P-values $\leq 5 \times 10^{-3}$. Our approach pinpointed SNPs

(such as rs17653532, 3:15115369, and rs74707084) with higher contribution to sepsis prediction and facilitating the discovery of sepsis risk loci with important functional implications related to gene expression regulation, DNA replication, cyclic nucleotide signalling, cell proliferation, and cardiac dysfunction. Key genes, such as ARHGEF10, PRIM2, SYNPR, RBSN, could provide potential targets for personalized sepsis interventions in surgical patients.

The figure shows the 20 SNPs with greater impact in sepsis predictions, SNPs that had not been reported previously. AX-15408387 (gene ARHGEF10) and AX-169104641 (gene PRIM2).

Conclusions: The combination of GWAS and XAI identified loci associated with sepsis susceptibility and established a powerful predictive approach. We identified potential biomarkers that might help in risk stratification, early detection of sepsis in postoperative patients, and targeted interventions.

Acknowledgements: Thanks to everyone in our multidisciplinary research team for their invaluable contributions to this project

34AP05-1

Septic shock in obstetric ICU: clinical profile and prognostic factors from a decade of experience

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Background and Goal of Study: Septic shock in obstetric ICU settings is a rare but life-threatening condition, posing a high risk of maternal and fetal mortality. It requires early recognition, multidisciplinary management, and aggressive therapeutic interventions to prevent organ failure. This study aimed to describe the clinical characteristics and identify prognostic factors associated with mortality among obstetric patients admitted for septic shock to better understand morbidity and mortality determinants.

Materials and Methods: This retrospective descriptive study was conducted over a 10-year period (2013–2022) in the obstetric ICU at CHU Ibn Rochd, Casablanca. It included 108 patients admitted for septic shock during pregnancy or the postpartum period. Data collected encompassed demographic information, medical and surgical history, clinical presentation at admission, severity scores (Glasgow Coma Scale and SOFA), organ dysfunctions, therapeutic modalities, and obstetric outcomes. Statistical analyses were performed to identify factors associated with severity and complications.

Results and Discussion: The mean age of patients was 35.1 years. Common clinical signs included fever (98.15%), tachycardia (>90 bpm in 81.48%), and hypoxemia (18.52%). Obstetric factors, such as a high number of interventions and elevated parity, were significantly associated with increased mortality (P=0.003 and P=0.025, respectively). Poor prognostic biological markers included leukopenia (P=0.030), elevated urea (P=0.004) and creatinine (P=0.002), and hyponatremia (P=0.019). Clinically, a mean arterial pressure <65 mmHg (P=0.005) and tachypnea (P<0.001) were strongly correlated with higher mortality. Therapeutic indicators of severity included the use of mechanical ventilation (P=0.000) and inotropes (P=0.012), while metronidazole therapy significantly reduced mortality (P=0.001).

Conclusion(s): Septic shock in obstetric patients remains a severe complication requiring prompt, multidisciplinary intervention. Identified risk factors, such as specific clinical and biological markers, should guide therapeutic strategies, including intravascular volume management, optimal oxygenation, and rapid administration of appropriate antibiotics to improve maternal outcomes.

34AP05-2

Urgent seven-level arthrodesis for mixed mycobacterium osteoarthritis: anesthetic management in a high-risk patient

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Tuberculosis remains the leading infectious cause of death globally¹, with vertebrae being the most commonly bone affected². However, less than half of cases result in neurological deficits. We present a unusual case of a 29-year-old Bangladeshi woman presented after a one-year delay misdiagnosed with mechanical pain. Progressive neurological symptoms led to a diagnosis of thoracic osteoarthritis secondary to tuberculosis; three-level thoracic osteoarthritis, extensive epidural abscess from T4 to C5, and severe spinal stenosis led to profound motor deficits (3/5 on the Daniels Scale) and urinary incontinence. The abscess extended into the cervical region, causing dysphagia. Despite severe rest pain (VAS 7-8), no prior opioid analgesia had been administered. Emergency surgical intervention involved a seven-level arthrodesis with abscess debridement, utilizing intraoperative neurophysiological monitoring (INM).

Preoperative optimization included hemoglobin stabilization and airway management avoiding neural cord injury.

A multimodal intraoperative anesthetic strategy was employed, including 200 mcg of intradural morphine despite the presence of epidural abscess. Advantages and disadvantages were discussed.

Boluses of lidocaine, magnesium sulfate, and dexmedetomidine were also administered, ensuring no interference with INM. Postoperative pain was managed with patient-controlled analgesia Postoperatively, the patient was transferred to the Intensive Care Unit (ICU) in a hemodynamically unstable state, where stabilization and extubation were achieved within an hour. Pathological analysis confirmed a dual infection with Tuberculosis and Mycobacterium avium complex. During her hospital stay, total intravenous morphine use was 29 mg. Pain scores dropped to 0 at rest and 8 during movement. The patient was discharged home within one week without complications. Significant motor function improvement (4+/5) has been observed.

This case underscores the vital role of anesthesiology in optimizing outcomes for high-risk, complex spine surgeries in infectious settings. It demonstrates how meticulous planning, innovative anesthetic techniques, and interdisciplinary collaboration can ensure patient safety, effective pain management, and rapid recovery.

References:

- 1. Global tuberculosis report 2024. Geneva. World Health Organization; 2024.
- Chilkoti, G. T. et al. Perioperative concerns in Pott's spine: A review. Journal of anaesthesiology, clinical pharmacology, 36(4), 443–449.

34AP05-3 Death during septic shock

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Background and Goal of Study: Septic shock is a major public health issue associated with a significant mortality rate in critically ill patients. Despite the recent advances in the management of this situation, the latter remains very challenging to handle.

Lot of studies were conducted in order to estimate the mortality associated to septic shock; the majority objectifies a variable rate which led us to consider the presence of several factors enabling to improve the prognosis.

The main objective of this study was to evaluate the mortality related to septic shock in our population and identify the risk factors that may influence this parameter.

Materials and Methods: This is a retrospective observational study, including all patients admitted initially for, or developed, a septic shock during their stay in the surgical intensive care unit of a tertiary care hospital centre over a period of 4 years from January 2015 to December 2018.

Mortality rate was evaluated according to demographic data, biological disorders, antibiotic therapy, and vasopressor prescription modalities.

Results and Discussion: 117 cases of septic shock were identified out of a total hospitalization of 1349 patients with an incidence of 8.6%. The average age of the patients was 54.48 years. The most common infectious site was the abdominal one (85%) with peritonitis accounting for 63% of these cases and a significant predominance of gram-negative bacilli.

The mortality rate in this population was estimated at 67.2% with male predominance.

A disturbed renal assessment and a low prothrombin Time were associated with a significantly higher mortality rate.

Early and adequate duration of antibiotherapy helped reduce the mortality.

The initial SOFA score, the number of organ failures and the doses of noradrenaline prescribed also influenced mortality rate in this population.

Conclusion(s): During this study, we were able to detect several factors that were associated with a significantly higher mortality during septic shock.

A clear understanding of these factors will help improve the management of this critical condition in order to improve its prognosis.

34AP05-5

Is postoperative oxygen saturation and the implementation of rescue ventilatory support associated with the incidence of surgical site infections? Post-hoc analysis of 2 randomized trials

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Background and Goal of Study: Surgical site infections (SSI) after major surgery are still common. Oxidative killing by neutrophils is the main defense against bacterial infections and it highly influenced by tissue oxygenation. We aimed to assess whether postoperative oxygen saturation and the implementation of ventilatory support are associated with the incidence of surgical site infections within 30 postoperative days.

Materials and Methods: This is a post-hoc analysis of two randomized clinical trials (IPROVE, IPROVE-O2). The primary outcome was a composite of surgical site infections (superficial, deep, or organ space infections), septic shock, and anastomotic leakage occurring between 7 and 30 postoperative days. The exposure was the airTest result, defined as positive if pulse oximetry £96%, or negative if pulse oximetry >96% while breathing ambient air in postaneshesia care unit (PACU); and the per protocol implementation of rescue ventilatory support lasting 6 hours in patients with positive airtest (CPAP/HFNC).

Results and Discussion: Our sample included 1701 patients. The overall incidence of the composite of SSI was 17%. Patients with negative airtest were younger and with lower BMI (Table 1). Patients with unrescued positive airtest had higher incidence of SSI than patients with negative airtest (24% vs 18%; p<0.05). Notably, patients with rescued positive airtest had lower incidence than patients with negative airtest (16% vs 18%; p<0.05). Finally, lower oxygen saturation during postoperative day 1 was associated with SSI within 90 postoperative days (p<0.05).

	Negative AirTest (n=1164)	Positive AirTest Rescued (n=131)	Positive AirTest Not rescued (n=95)	P Value
Age, y.o	64 ± 13	68 ± 12	68 ± 12	P<0.05
Sex male/female n, (%)	723(62)/442(38)	86 (66)/ 45 (34)	62 (65)/33 (35)	NS
BMI, Kg/m ²	26 ± 4	27 ± 4	28 ± 5	P<0.05
Active smoker n, (%)	139 (12)	37 (28)	16 (17)	NS
SpO2 airtest, %	98.2 ± 1.1	92.8 ± 2.6	94.5 ± 1.6	P<0.05
SpO ₂ POD1, %	97.0 ± 2.1	95.6 ± 3.3	95.5 ± 2.6	P<0.05
Composite of SSI, n, (%)	211 (18)	21 (16)	23 (24)	P<0.05

Conclusion(s): Low oxygen saturation while breathing ambient air at PACU may allow us to detect patients at risk of SSI. Providing respiratory support might decrease this risk.

34AP05-8

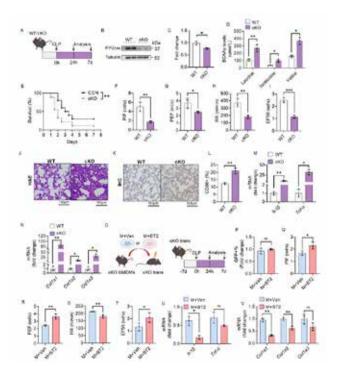
Macrophage with impaired BCAAs catabolism exacerbates alveolar epithelial injury post-sepsis by activating mitochondria-localized AGEs-RAGE mediating mtDNA release

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Background and Goal of Study: Lung is the foremost vulnerable organ during sepsis. Accumulating evidence shows impaired BCAAs catabolism couples with macrophage activation. AGEs-RAGE interactions trigger oxidative stress and disproportionate inflammation. In this study, we explored the molecular mechanisms underlying the exacerbated sepsis-induced lung injury aroused by impaired macrophages BCAAs catabolism, which leads to increased mitochondria-localized AGEs-RAGE interactions facilitating mtDNA release and exacerbates alveolar epithelial barrier damage.

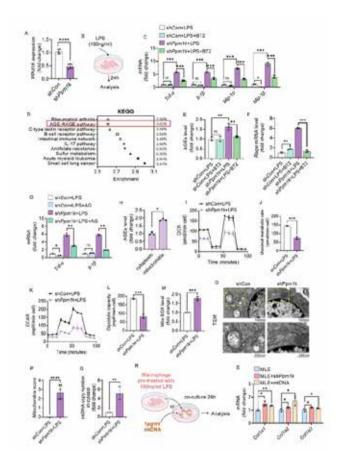
Materials and Methods: Ppm1k^{Lyz2}-/- (cKO) mouse was used to construct sepsis model. Lung injury was inspected by H&E dyeing, CD86+ cells by immunohistochemistry, and inflammatory cytokines q-PCR. Mitochondrial is tested by TEM and Seahourse energy analyzer.

Results and Discussion: Deteriorated ventilation, increased lung lesions and CD86 $^{+}$ macrophage fraction were detected in cKO lungs together with high inflammatory state proved by high IL-1 \square and TNF- α levels.



AGEs-RAGE interaction was upregulated by defective BCAA catabolism and AGEs in the mitochondria played a predominant role. TEM showed obvious mitochondrial damage in shPpm1k (KO) macrophages. The mitochondrial respiration and glycolysis assessed by OCR and ECAR was decreased in KO macrophages

accompanied by mtROS production and mtDNA release. Co-culturing alveolar epithelial cells with KO macrophages or mtDNA improves the level of Col1a1, Col1a2 and Col1a3.



Therefore, our study reveals a critical role of the AGES-RAGE interactions in sepsis-induced lung injury under impaired BCAAs catabolism and identifies mtDNA as a potential therapeutic target

Conclusion(s): In summary, impaired macrophage BCAAs catabolism predisposes the mouse lung to alveolar epithelial damage due to mitochondria-localized AGES-RAGE interactions triggering mtDNA release.

34AP05-11 Life-threatening cold agglutinin syndrome: case report

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Background: Cold agglutinin syndrome (CAS) is rare subset of autoimmune hemolytic anemia estimated incidence of 1:100 000 adults (1) occasionally complicating specific infections (e.g. Mycoplasma pneumoniae or Epstein–Barr virus) or malignancies. Cases of CAS with life-threatening anemia are reported in the literature by a limited number of cases.

Case Report: 20-year-old male was admitted to the intensive care unit (ICU) with severe hemolytic anemia and cold agglutinins identified at a referring hospital a few days before. The direct antiglobulin test was positive with C3d complement deposition while the eluate was non-reactive. Further testing revealed presence of cold-reactive IgM autoantibodies. The patient was diagnosed with a life-threatening hemolytic crisis secondary to autoimmune hemolytic anemia associated with cold agglutinins likely triggered by an infection. He had history of an upper respiratory tract infection accompanied by jaundice and hepatosplenomegaly 10 days prior to admission.

Tests performed on ICU admission revealed signs of severe hemolysis: hemoglobin 4,0 g/dl, total bilirubin 26.6 mg/dL with direct 20.3 mg/dl, LDH 3137U/l. Initial treatment in the ICU comprised corticosteroid therapy, two of therapeutic plasma exchange (TPE), intravenous immunoglobulin (IVIG) administration, transfusion of blood products and continuous warming.

After 3 days in the ICU, the patient's condition gradually improved and he was transferred to the hematology department for further management. Bone marrow biopsy excluded malignancy. Serological testing confirmed recent EBV infection and concurrent Mycoplasma pneumoniae infection.

Due to persistent anemia, the patient received rituximab on day 12 of hospitalization. He was discharged home and subsequently readmitted for additional rituximab infusions. The patient remains under close supervision at the Hematology Outpatient Clinic.

Discussion: The case highlights complexity of diagnosing and managing severe hemolysis caused by cold agglutinins. The patient had these two etiological factors of CAS therefore their synergistic effect cannot be excluded

Reference:

1. Hendrickson, J.E. & Tormey, C.A.. (2014). The RBC as a Target of Damage. 10.1016/B978-0-12-386456-7.06203-1

Learning points: The case underscores the importance of recognizing infection-associated autoimmune hemolytic anemia with cold agglutinins. Targeted therapies, including TPE, IVIG, and rituximab are crucial in preventing further hemolysis

Hepatobiliary and Kidney

35AP01-1

Prediction of acute kidney injury in the immediate postoperative period following liver resection

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Background and Goal of Study: Restricting fluid administration to target a low central venous pressure or using intraoperative phlebotomies have become common practices to reduce intraoperative blood loss and perioperative complications in liver resec-

Following these surgeries, acute kidney injury (AKI) is a frequent, morbid, yet potentially reversible complication. Identifying early postoperative reversible AKI may be important to ensure sustained clinical benefits from commonly used intraoperative fluid management strategies.

No predictive model of postoperative AKI following liver resection has assessed the role of oliguria in the Post-Anesthesia Care Unit (PACU).

Our objectives were:

- 1. To develop and internally validate a predictive model of postoperative AKI using variables available in the PACU,
- 2. To assess the additive predictive value of PACU urine output, and;
- 3. To estimate the association between PACU oliguria and AKI.

Materials and Methods: We conducted a retrospective study of patients who underwent elective liver resection at the Centre hospitalier de l'Université de Montréal between may 2010 and novembre 2022. Our outcome was 7-day postoperative AKI. Oliguria was defined as a PACU urine output under 0.5 mL/kg/h.

Two sets of candidate predictors (17 and 11 variables respectively) were used to develop a predictive model for postoperative AKI. We fitted multivariable logistic regression models with a least absolute shrinkage and selection operator.

We reported oliguria risk ratios (RR) with 95% confidence interval (CI) and optimism-corrected model performance properties.

Results and Discussion: We included 1520 patients. Both the incidence of 7-day postoperative AKI and the prevalence of oliguria in the PACU were 11%. Being oliguric in the PACU was associated with AKI (RR = 1.74 (95% CI [1.20, 2.50]).

Both developed models had good discrimination (AUROC curve of 0.775 and 0.766 respectively) and excellent calibration. PACU urine output increased models' discrimination.

Conclusion(s): We developed good models to predict 7-day postoperative AKI following liver resection. PACU oliguria was associated with 7-day postoperative AKI and its use improved discriminative properties of our models.

35AP01-2

Effect of acute hypervolemic hemodilution and fluid restriction on bleeding in hepatectomy: a retrospective cohort study

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Background and Goal of Study: Reducing bleeding in hepatectomy improves the prognosis of the patients. Fluid restriction based on the low central venous pressure (LCVP) is commonly recommended in hepatectomy to decrease intraoperative bleeding, but its safety and efficacy are still debated. Although acute hypervolemic hemodilution (AHH) is used to protect blood during a variety of procedures, there is no research on its application in liver surgery. The purpose of this study is to examine how AHH and fluid restriction affect blood loss during hepatectomy.

Materials and Methods: In this historical cohort study, patients who had hepatectomy procedures at Sichuan University's West China Hospital between July 2017 and November 2022 were categorized into either fluid restriction group or AHH group to see whether the blood loss in these two groups varied. Propensity score matching (PSM) was performed to adjust the group's imbalance.

Results and Discussion: Prior to PSM, 358 patients were enrolled based on eligible criteria, while 162 patients were enrolled following 1:1 PSM. Blood loss did not differ statistically significantly between the two groups following PSM. Yet there was significant difference between the fluid restriction group and the AHH group in terms of intraoperative urine [141.4 (70.9,142.2) mL/h versus 141.4 (117.1,187.5) mL/h, P=0.03], intraoperative infusion [2800(2100,2993) mL versus 2993(2750,3750) mL, P<0.01], and norepinephrine use rate (33.3% versus 18.5%, P=0.04).

Conclusion(s): The effects of restricted infusion and AHH on blood loss in hepatectomy did not differ significantly, while the use of AHH was linked to a lower rate of norepinephrine use and an increase in intraoperative urine. The notion that fluid infusion should be limited during hepatectomy is disproved by this study, and a novel fluid management approach is offered that could help with circulation control during partial hepatectomy.

The association between perioperative hemodialysis timing and postoperative complications

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Background and Goal of Study: End-stage renal disease (ESRD) patients undergoing surgery face high perioperative risk. While the timing of preoperative hemodialysis (HD) is considered crucial, the optimal timing remains unclear. Though various expert groups have recommended different guidelines, supporting evidence is limited. This study aimed to analyze the impact of HD timing on postoperative complications and provide supporting evidence for optimal timing recommendations.

Materials and Methods: This study included adult ESRD patients who underwent surgery under anesthesia at Seoul National University Hospital between January 2011 and December 2020. Only patients who had scheduled HD within three days prior to surgery were included, while those undergoing same-day surgery, kidney transplants, or surgeries requiring cardiopulmonary bypass were excluded. With preoperative hemodialysis timing, baseline, surgical and intraoperative variables were collected.

The primary outcome was the association between preoperative HD timing and a composite outcome, which included ICU admission, mechanical ventilation, continuous kidney replacement therapy (CKRT) within seven days, and in-hospital mortality.

Results and Discussion: A total of 1,935 patients were analyzed. Baseline characteristics were similar, but surgical risk and several intraoperative variables varied across the groups. Multivariate analysis showed that HD on the day of surgery was independently associated with an increased risk of the composite outcome, ICU admission, and ICU discharge within 7 days, even after adjusting for confounders (Figure 1).

Preoperative HD timing	m/N(%)	OR (96% CI)	1 (4)	P-value
Composite outcome			- 1	
2 or 3 days before	56473 (11.6)	Reference		
1 day before	186/1004 (18.5)	1.31[0.90, 1.95]	****	0.17
on the day	109/458 (23.8)	1.82(1.19, 2.80)		<0.01
Vortality				
2 or 3 days before	9/473 (1.9)	Reference	7.0	
1 day before	21/1004 (2.1)	1.25(0.56, 3.13)		0.61
on the day	16/458 (3.5)	1.52[0.62, 4.00]	to the t	0.38
CU admission within 7 days				
2 or 3 days before	54473 (11.4)	Reference		
1 day before	179/1004 (17.7)	1.27[0.86, 1.90]		0.24
on the day	107/468 (23.4)	1.83[1.19, 2.84]		< 0.01
Discharge to ICU				
2 or 3 days before	47/473 (9.9)	Reference		
1 day before	160/1004 (15.9)	1.33(0.88, 2.05)	-	0.19
on the day	97/458 (21.2)	1.90[1.22, 3.00]		×0.01
CKRT within 7 days			0.0	
2 or 3 days before	9473 (1.9)	Reference		
1 day before	13/1004 (1.3)	1.01(0.37, 3.06)		0.98
an the day	13/458 (2.8)	1.24[0.44, 3.76]		0.69
W within 7 days				
2 or 3 days before	20/473 (4.2)	Reference		
. 1 day before	47/1004(4.7)	1.13(0.61, 2.23)		0.7
on the day	13/458 (2.8)	1.78[0.90, 3.57]		0.1

Subgroup analysis of patients who underwent general anesthesia further demonstrated that HD on the day of surgery was linked to a higher risk of postoperative complications compared to HD performed 2-3 days before surgery.

Conclusion(s): HD on the day of surgery before surgery was associated with significantly higher risks of postoperative complications compared to 2-3 days prior. Optimal HD timing should be considered to mitigate hemodynamic instability or electrolyte disturbances during the perioperative period.

35AP01-5

Risk factors associated with postreperfusion syndrome in pediatric liver transplantation after living donation: a retrospective study

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Background and Goal of Study: Postreperfusion syndrome (PRS), defined as a drop in mean arterial pressure of ≥ 30% from its baseline value, lasting at least one minute during the five minutes after unclamping, is frequent in adult liver transplantation and is associated with a higher incidence of postoperative complications and an increased risk of early allograft dysfunction (EAD). There is currently no data on PRS in living-donor liver transplantation (LDLT) in child recipients.

This study assesses the incidence and identifies factors associated with PRS in this population.

Materials and Methods: The medical records of 185 consecutive children (≤ 12 years) who underwent LDLT between January 2012 and December 2022 were retrospectively reviewed. Children were divided into PRS and non-PRS groups. Pre-, intra- and postoperative data were summarised as median (IQR) or numbers (%) and compared between the two groups. Predictive factors for PRS were identified using univariate and multivariate logistic regression after variable selection with a backward stepwise method.

	Non-PRS (n = 138)	PRS (n = 47)	Total (n = 185)	p-value
Recipient's age (months)	19.5 (27.2)	11.2 (13.5)	16.6 (21.7)	0,0007
PELD score	11.5 (16.9)	20.2 (17.4)	12.2 (15.5)	0.0024

After multivariate logistic regression, PRS was associated with a longer duration of warm ischemia, a lower serum Ca2+ before reperfusion, and a higher graft-to-recipient weight ratio.

	Non-PRS (n = 138)	PRS (n = 47)	Total (n = 185)	OR for PRS	95%	6CI	p-value
Warm ischemia duration (min)	39 (13)	42 (15)	40 (13)	1.03	1.01	1.06	0.0130
Serum Ca ²⁺ before reperfusion (mg/mL)	4.6 (0.6)	4.4 (0.6)	4.5 (0.6)	0.45	0.24	0.85	0.0106
Graft-to-recipient weight ratio (%)	2.52 (1.66)	3.32 (1.51)	2.75 (1.64)	1.78	1.29	2.46	0.0002

Children with PRS had higher transfusion and vasopressor requirements and longer ICU stays without increased EAD or death at 6 months.

	Non-PRS	PRS	Total	p-value
	(n = 138)	(n = 47)	(n = 185)	
Fresh Frozen Plasma (ml/kg)	0.0 (29.2)	33.6 (63.7)	11.3 (39)	0.0001
Red Blood Cells (ml/kg)	25.8 (29.7)	37.6 (45.7)	27.7 (30.6)	0.0003
Noradrenalin max (µg/kg/min)	0.09 (0.10)	0.12 (0.13)	0.10 (0.12)	0.0009
ICU stay (days)	3 (3)	4 (5.5)	3 (4)	0.0334
Early Allograft Dysfunction	32 (23,2%)	12 (26,1%)	44 (23,9%)	0.6917
6-month survival	135 (97,6%)	44 (93.6%)	179 (96.8%)	0.1888

Results and Discussion: PRS occurred in 47 children (25.4%). Patients affected by this syndrome were younger and had significantly higher PELD scores.

Conclusions: PRS occurs in a quarter of children undergoing LDLT. Further studies are needed to determine whether optimising identified risk factors could reduce the incidence of this syndrome and its associated complications.

35AP01-6

The beneficial effects of hydrogen inhalation on renal glycocalyx degeneration after haemorrhagic shock in a rat model

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Background and Goal of Study: The vascular endothelial glycocalyx (GCX), located on the endothelial surface, maintains vascular homeostasis but is easily damaged after ischaemia-reperfusion injury. Shedding of GCX due to massive haemorrhage can lead to vascular leakage during fluid resuscitation. Additionally, kidney injury caused by massive haemorrhage is also a major concern. Recently, beneficial effects of hydrogen inhalation on haemorrhagic shock have been reported. However, the effectiveness of hydrogen in preventing kidney injury remains unclear. In this study, we evaluated the effect of hydrogen inhalation in mitigating GCX shedding in the kidneys during haemorrhagic shock using a rat model.

Materials and Methods: Rats under general anaesthesia were divided into three groups: the sham, haemorrhagic shock, and 3% hydrogen groups. Except for the sham group, bloodletting was performed to maintain blood pressure below 80 mmHg for 60 minutes. In the 3% hydrogen group, 3% hydrogen inhalation was initiated before bloodletting. GCX in the kidneys was measured before and 30 and 60 minutes after haemorrhagic shock. Additionally, reactive oxygen species were measured by d-ROMs test before and 60 minutes after bleeding. GCX thickness was evaluated using the GlycoCheck system (Microvascular Health Solutions, Orem, Utah, USA) by assessing the perfused boundary region (PBR) of red blood cells. GCX and d-ROMs were evaluated using two-way ANOVA, with p<0.05 considered statistically

Results and Discussion: An increase in PBR indicates glycocalyx degeneration. The hydrogen group significantly suppressed the increase in PBR compared to the shock group at both 30 and 60 minutes (p<0.001), indicating that hydrogen has a protective effect on renal GCX after haemorrhagic shock. The increase in d-ROMs was also significantly reduced in the hydrogen group compared to the shock group (p<0.001).

Conclusion: This study demonstrated that hydrogen inhalation in a haemorrhagic shock model attenuates renal injury by preserving GCX thickness.

35AP01-7

Clinical and hemodynamic factors associated with hemoglobin levels in patients with liver cirrhosis

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Background and Goal of Study: Liver cirrhosis with portal hypertension leads to hemodynamic alterations, including hydrosaline retention, increased plasma volume, increased cardiac index (CI) and decreased systemic vascular resistance (SVR). The effect of these hemodynamic changes on hemoglobin (Hb) levels has not been specifically evaluated. Previous studies suggest that anemia may worsen hyperdynamic circulation, though it remains unclear whether anemia is a cause or consequence of this condition.

The aim was to study the association between Hb levels and clinical as well as hepatic and systemic hemodynamic variables in cirrhotic patients, both at baseline and in relation to temporal changes in these variables.

Materials and Methods: A retrospective cohort of cirrhotic patients was analyzed, all of whom had undergone two serial hemodynamic assessments (hepatic and systemic) separated by at least 3 months. Between these two assessments, most patients received treatments that modulate hemodynamics. Baseline clinical and hemodynamic variables associated with Hb levels were studied, along with the association between changes in Hb and changes in other variables.

Results and Discussion: 242 patients were included: 88 with HCV eradication, 71 with TIPS placement, 33 with β-blocker initiation, and 50 with no significant events between assessments. At baseline, various clinical and hepatic function variables (prothrombin, albumin, Child score, MELD score, sodium, ascites), systemic hemodynamics (CI, SVR, mean arterial pressure (MAP)), and hepatic hemodynamics (HVPG, wedge hepatic venous pressure (WHVP)) correlated with Hb levels. In multivariate analysis, albumin (β =0.41), ascites grade (β =-0.24), and CI or indexed SVR (β =-0.20 and β =0.23, respectively) were correlated with Hb (adjusted R2=0.38).

In analyzing changes between hemodynamic assessments, changes in Hb correlated with changes in albumin (β=0.45), CI (β =-0.21), and MAP (β =0.13) (or indexed SVR, β =0.24); global adjusted R2=0.34. Changes in hepatic hemodynamics did not independently correlate with changes in Hb. Subgroup analysis showed similar results. Albumin had the strongest correlation with Hb and its changes across all comparisons.

Conclusion: Hemoglobin levels and their temporal changes in cirrhotic patients are largely correlated with albumin levels and variables related to hyperdynamic circulation and hydrosaline retention, suggesting a significant dilutional component in its values.

New methods in pain management after HPB surgeries. Can we lower opioid consumption? Randomized controlled trial

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Background and Goal of Study: Patients after HPB surgery endures high levels of pain which causes negative neurohumoral response. Patients who receive standard post-op pain management receive high doses of NSAIDs and opioids which have negative impact on respiratory system, induce nausea and vomiting, obstipation, urinary retention [1]. Therefore, close patient's monitoring is required, which is difficult in surgery unit. Our study's aim is to lower opioids intake with interventional method consisting of abdominal wall catheters and Ropivacaine infusion.

Materials and Methods: patients were enrolled November 2022 - November 2023 after bioethical permission was obtained. Inclusion criteria: patient's consent; patients, 18 years old or older, transverse laparotomy incision. Exclusion criteria: opioid-dependent patients, underaged patients, hepatic insufficiency (Child-Pugh C) or chronic kidney disease (>3 st.), refusal to participate. Included patients were randomized into two groups: interventional (I) (abdominal wall catheter with Ropivacaine infusion) and standard (SM) (systemic analgesics). Opioids' requirement and consumption was documented during day of surgery and 2 postop days. Different opioids doses were converted into Morphine equivalents.

Results and Discussion: During this period 34 patients were enrolled to the study. Two groups did not differ significantly. In both groups patients were treated with opioids and NSAIDs. Opioid consumption was significantly higher in SM group in PACU and 2 postoperative days on the ward. Total opioid requirement was also significantly higher in SM group. We observed no difference in opioid consumption during surgery.

Morphine equivalents	SM group (n=20)	I group (n=14)	p value
Surgery	47,5(0-70; 45,75)	45(35-60;46,43)	0,937
PACU	10(0-45;13,29)	2,5 (0-20; 5,3)	0,02
Day 1	10(0-200; 19,25)	0(0-10; 1,79)	<0,001
Day 2	12,5(0-200; 21,5)	0(0-5; 1,79)	<0,001
Total	75(30-470;99,79)	57,5(36,25 -75; 55,3)	<0,001

Conclusion(s): Patients who received pain management with abdominal wall catheters and Ropivacaine infusion required significantly less opioids compared to SM group. It is likely that those patients would also experience less opioid related adverse reactions but further investigation is needed.

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35AP01-10

Optimization of donor kidneys with sevoflurane during normothermic machine perfusion

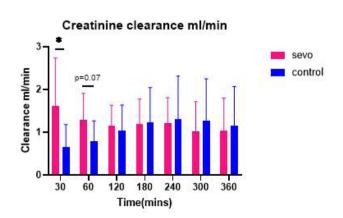
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Background: Volatile anesthetics, like sevoflurane, have shown to reduce ischemia reperfusion injury in multiple studies. The potential mechanisms of protection involve inhibition of opening mitochondrial permeability transition pores, protection of the endothelial cells and glycocalyx, inhibition of inflammation. Normothermic machine perfusion (NMP) of kidneys creates a therapeutic window of opportunity to add pharmacological substances to reduce injury, enhance repair and evaluate organ function before transplantation.

We hypothesize that administration of sevoflurane during NMP reduces injury and improves kidney quality.

Method: We set-up a slaughterhouse porcine model with administration of sevoflurane using a vaporizer during NMP and tested the feasibility. Then executed 16 experiments (8 paired kidneys, n8/group), with or without sevoflurane. Kidneys were retrieved and underwent 30mins warm ischemia time then flushed with UW solution, preserved cold storage for 24h, after which 6h NMP was initiated. Sevo-group (n=8) was treated with 4% sevoflurane for the first 1h during the 6h NMP while the Control-group was treated without sevoflurane. Perfusate, urine, and tissue samples were collected and physiological measurements were recorded.

Results: There were no differences in intrarenal resistance. flow rate, fractional sodium excretion, lactate, weight gain between two groups. The Sevo-group showed higher urine production at 30mins (p=0.04) and higher oxygen consumption at 60mins (p=0.01). Total protein and cumulative protein in urine in Sevogroup were increased at multiple timepoints. Creatinine clearance in Sevo-group was also higher than Control-group within the first hour. Both AST and LDH in the perfusate of Sevo-group showed significantly higher levels compared to the Control-group at multiple timepoints. Sevo-group 30mins fractional potassium excretion was reduced (p=0.04) while urea in the urine was increased statistically (p=0.05).



Conclusion: Administration of sevoflurane during the kidney normothermic machine perfusion is feasible. Vaporizer setting 4% of sevoflurane can promote glomerular filtration rate but may cause potential renal cell damage.

35AP01-11

Modification of the MEAF score to predict allograft liver failure after transplantation

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Background and Goal of Study: There are many scores in the literature that try to predict liver function in the postoperative liver transplant setting. In our cohort the one that better predicts the outcome is the MEAF score (E pareja et al. Liver transplantation 2015), by its simplicity and good accuracy. We want to improve this accuracy by adding the need of transfusion (more than 3 intraoperative red blood cells packages) and the presence of postreperfusion syndrome in the original formula.

Materials and Methods: All patients undergoing liver transplantation from 2008 to 2018 were included retrospectively. Demographyc data, RBCp intraoperatively administered, presence of post-reperfusion syndrome, and follow up until day 90,180, 365 were recorded, mortality and retransplantation. MEAF score was calculated and then we added the item of more than 3 RBCp transfused in a logarythmic way and the dycothomic variable of the presence of post-reperfusion syndrome to the formula.

Results and Discussion: The MEAF score has an accuracy in predicting liver failure in the first 90 days of 0.7 in our cohort. By adding these two parameters (more than 3 RBCp administered during the surgery and the presence of reperfusion syndrome) the accuracy of this score improved to 0.82.

Conclusion(s): The addition of two intraoperative data to the MEAF score, improves its accuracy keeping the simplicity of the original formula. Prospective and external validation is still needed.

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35AP01-12

To transplant or not transplant: decision-making and intraoperative management in liver transplantation of a patient with severe portopulmonary hypertension

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Background: This case presents a liver transplant performed on a patient with severe portopulmonary hypertension (PPH).

Case report: A 68-year-old male with a history of hypertension, type 2 diabetes, cirrhosis of mixed etiology (alcoholic, HCV, metabolic), and severe PPH. He was on triple vasodilator therapy with Sildenafil, Macitentan, and continuous infusion of Treprostinil, His mean pulmonary artery pressure (PAPm) was 32 mmHg and pulmonary vascular resistance (PVR) was 2.76 uW, with good right ventricular function on echocardiography.

On the day of the transplant, his condition was reassessed with echocardiography, showing good biventricular function. Before the induction pulmonary artery catheter was placed, showing a PAPm of 49 mmHg and PVR of 3.2 UW. Optimization was performed with 80 mg of Furosemide and 10 mg of Sildenafil, improving the PAPm to 38 mmHg, before induction.

Intraoperatively, hemodynamic monitoring was performed using invasive blood pressure, central venous pressure (CVP), and transesophageal echocardiography (TEE). Inhaled nitric oxide, repeated doses of inhaled lloprost, and intravenous treprostinil were administered. PAPm was maintained between 29-46 mmHg. and right ventricular function remained stable . The patient required intraoperative norepinephrine, blood transfusions and bolus of epinephrine during the suprahepatic clamp.

After the procedure, he was transferred intubated to the ICU, on norepinephrine, intravenous treprostinil, and nitric oxide.

Discussion: PPH increases the risk of intraoperative and postoperative mortality in liver transplantation, making a risk-benefit balance essential1. In moderate to severe PPH cases, assessing right ventricular function and the response to vasodilator therapy is crucial. Perioperative management is challenging due to the risk of hemodynamic instability.

The goal is to maintain adequate right ventricular function and achieve a balance in PAPm, with continuous monitoring2.

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Learning points: PPH significantly increases morbidity and mortality in liver transplantation.

Proper preoperative optimization and effective intraoperative hemodynamic management are crucial.

Different pain management methods after HPB surgeries in the long perspective. Patients' interview 3 months after randomized controlled trial

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Background and Goal of Study: patients after HPB surgeries experience high levels of pain which could have an impact in longer perspective. Postoperative pain impacts patients' socioeconomic well-being and their possibility to fully recover from major abdominal surgery. During initial study two pain control methods were compared: standard management (SM group) and abdominal wall catheters with Ropiyacaine infusion (intervention, I group).

Aim of the study was to evaluate patients' ability to fully recover after HPB surgeries depending on pain management method.

Materials and Methods: patients, eligible to participate in the initial study (patient's consent; >18 years old, transverse laparotomy, not opioid-dependent, no hepatic insufficiency (Child-Pugh C) or chronic kidney disease (>3 st.)) were contacted by phone 3 months post-op. Interview questions included chronic pain after surgery, constant need of analgesics, time of full recover, residual effects and overall experience of pain management. Qualitative data management methods were used. Bioethical permission was obtained before the study and patients were informed about the upcoming contact.

Results and Discussion: 56 patients were contacted 3 months post-op. 40(71,43%) interviews were successful, 8(14,29%) interviews failed and 8(14,29%) patients were already dead at that time. All patients fully or partially returned to their normal activities in 3 months after the surgery.

	l group (n=19)	SM (n=21)
Fully satisfied	17(89,47%)	17(80,95%)
Abdominal discomfort	3(15,79%)	4(19,04%)
Pain	1(5,26%)	1(4,76%)
NSAIDS	4(21,05%)	1(4,76%)
Bowel movement disorders	4(21,05%)	1(4,76%)
Abdominal numbness	1 (5,26%)	2(9,52%)
Reactions after chemo	5(26,32%)	5(23,81%)
Surgical complications	1(5,26%)	3(14,29%)

Conclusion(s): effective pain management is one of the most important factors for patient well-being and overall satisfaction after surgery. Data from interviews revealed that patients were equally satisfied and adverse effects were mostly related to consecutive chemotherapy rather than postoperative pain management methods.

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35AP02-1

Effect of the strategy that transesophageal echocardiography-guided unrestricted fluid combines with dobutamine on hepatic venous blood flow velocity in patients undergoing laparoscopic hepatectomy

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Background and Goal of Study: Current recommendations suggest limiting fluid to achieve low central venous pressure during laparoscopic hepatectomy to reduce bleeding, but this may cause circulatory instability and tissue hypoperfusion. The key is to enhance hepatic venous blood return. So we will assess the effect of the strategy that transesophageal echocardiography(TEE)-guided unrestricted fluid combines with dobutamine on hepatic venous blood flow velocity in these patients.

Materials and Methods: 52 patients undergoing partial hepatectomy from November 2023 to March 2024 were randomly assigned to dobutamine or control group, each with 26 patients. The dobutamine group received 3 μg/kg/min dobutamine after anesthesia induction, guided by TEE to maintain normal preload, while the control group received normal saline and 3-4 mL/kg/h of equilibrium solution. Hepatic vein blood flow spectra, including maximum velocity (VmaxS and VmaxD) and velocity time integral (VtiS and VtiD) of the S wave and D wave, were recorded at four time points: after anesthesia induction (T1), 10 minutes post-administration (T2), after pneumoperitoneum (T3), and after hemostasis (T4). Data were analyzed using generalized estimating equations.

Results and Discussion: At T2, differences were found in VmaxS (P=0.002), VtiS (P=0.03), and VmaxD (P=0.008) between the two groups. At T4, VmaxS (P=0.006), VtiS (P=0.02), VmaxD (P=0.001), and VtiD (P<0.001) also differed (Fig. 1). No differences were found at T1 and T3. Intraoperative bleeding was lower in dobutamine group (356±198mL) than in control group (470±381mL), but this was not statistically different. The area under the curve for hypotension showed no difference (P=0.77), but the use of vasoactive drugs was significantly lower in the dobutamine group (P=0.02).

Conclusion(s): Intraoperative TEE-guided unrestricted fluid combines with dobutamine improved hepatic venous blood flow and decreased the use of vasoactive drugs in laparoscopic hepatectomy patients. This challenges the conventional fluid restriction approach, indicating that future research should prioritize low hepatic venous flow over low central venous pressure.

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Effects of dobutamine on hepatic blood flow: results of the DobuWhipple trial

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Background and Goal of Study: Hepatic blood flow (HBF) is influenced by adrenergic stimulation, Dobutamine (DOBU), a commonly used inodilator, may impact HBF directly but also indirectly by enhancing cardiac index (CI).1 While previous studies have shown an increase in overall intestinal blood flow, its specific effects on HBF remain uncertain. This study aimed to assess the impact of DOBU administration on HBF.

Materials and Methods: Following approval from the ethical committee and obtaining written informed consent, patients scheduled for pancreaticoduodenectomy were enrolled in the study. Anesthesia was administered to all participants using targetcontrolled anesthesia with propofol (Schnider) and remifentanil (Minto). Hemodynamic data were measured, monitored, and recorded using Pulsioflex™. HBF was assessed using ultrasound transit time (Medi-Stim AS). Baseline measurements (T1) were taken before initiating dobutamine (DOBU) at 2 mcg/kg/min (T2), which was then increased to 5 mcg/kg/min (T3). A minimum interval of 10 minutes was maintained between each measurement. Hemodynamic variables, indexed hepatic arterial flow (HAFi), and indexed portal vein flow (PVFi) were measured and recorded simultaneously. Statistical analysis was performed using linear mixed modeling.

Results and Discussion: A total of 30 patients were included. DOBU dose-dependently increased CI and heart rate (HR). The predicted increase in PVFi was 87 ml.min-1.m-2 (+/- 16 ml.min-1.m-2) at T3 (p < 0.05) and the predicted decrease in HAFi was 38 ml.min-1.m-2 (+/- 11 ml.min-1.m-2) at T3 (p < 0.05). This resulted in a predicted increase in total HBFi was 49 ml.min-1.m-2 (+/- 16 ml.min-1.m-2) at T3 (p < 0.05). This effect was dose-dependent and more pronounced at higher dosages of DOBU. (see table) Tabel: Data are mean (SD)

	T1	T2	Т3
Total HBF _{indexed} (ml.min-1.m-2)	515 (182)	538 (137)	564 (154)#
Total HBF _{relative} (% of CI)	16.8 (5.9)	16.2 (4.3)	16.2 (4.3)
HAFi (ml.min-1.m-2)	183 (116)	169 (92)	145 (87)#*
HAF _{relative} (% of CI)	6.0 (3.9)	5.2 (2.9)#	4.3 (2.5)#*
PVFi (ml.min-1.m-2)	332 (110)	369 (120)#	418 (141)#*
PVF _{relative} (% of CI)	10.8 (3.6)	11.1 (3.5)	12.0 (3.8)#*
CI (L.min-1.m-2)	3.1 (0.5)	3.4 (0.5)#	3.5 (0.6)#
HR (bpm)	78 (9)	89 (14)#	111 (14)#*

Conclusion(s): DOBU in incremental dosages had an opposing effect on PVFi and HAFi. The net effect on total HBF was a small significant increase.

References:

1. Gelman S. Anesthesiology 2004; 100:434-439.

35AP02-3

Digital twin with generative artificial intelligence: personalized dynamic management of renal risk in ICU

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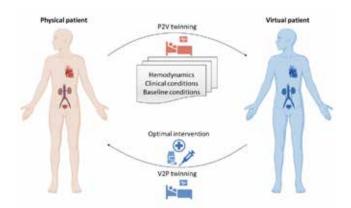
Background and Goal of Study: Managing renal functions to reduce acute kidney injury (AKI) risk is crucial in ICU settings. Cardiorenal interactions significantly impact hemodynamics management and ICU interventions. Conditions like sepsis, insufficient cardiac output, and nephrotoxic drugs increase AKI risk, especially in those with chronic kidney disease. Renal injury often signals multiple organ failure and is linked to high mortality. Advances in health digital twins (HDT) using generative AI (GAI) and ICU monitoring data offer promising solutions for personalized AKI risk management.

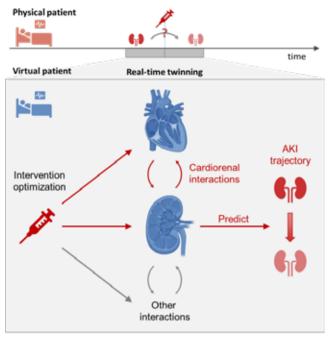
This study aims to utilize digital twin technology to guide ICU treatment, preventing or resolving AKI instances.

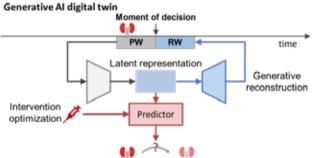
Materials and Methods: We developed a GAI-based HDT model to dynamically evaluate ICU interventions' impact on AKI risk. The model includes vasopressors, fluid management, diuretics, and antibiotics for sepsis treatment, all affecting renal functions. For each patient, a virtual twin is created based on demographic and clinical data at ICU admission. During the ICU stay, clinical conditions, vital signs, organ functions, and interventions are updated in real-time to the virtual twin via P2V twinning, represented in GAI's latent space. Potential treatments' effects on AKI risk are predicted and evaluated on the virtual twin before implementation on the physical patient.

Results and Discussion: Our GAI HDT model was trained and tested with MIMIC IV ICU data and validated with ICU patients at Indiana University Health (2021-2024). The primary outcome is the 24-hour AKI progression trajectory score post-intervention. The preliminary model achieved a concordance index of 0.73 (CI: 0.72-0.74), demonstrating promising performance.

Conclusion: This preliminary study shows the potential of using GAI HDT for personalized, dynamic ICU management to estimate and reduce renal risk.







Ultrasound assessment of abdominal wall muscle thickness: a comparative study of sarcopenia in liver transplant recipients and healthy donors

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Background and Goal of Study: Sarcopenia is strongly correlated with postoperative mortality in living donor liver transplant recipients. Sarcopenia has previously been assessed based on CT findings. However, measurement of abdominal muscle thickness for assessment of sarcopenia in liver transplant recipients has not been attempted before. We expect to ascertain abdominal wall thickness in cirrhotics by the use of ultrasound and correlate values with standard markers of sarcopenia (handgrip strength and L3-SMI), disease severity scores, and also with post-operative outcomes

Materials and Methods: All adults undergoing LDLT from October 2023 until April 2024 were included. L3 SMI on abdominal CT (Figure 1), hand grip strength and ultrasound guided abdominal muscle thickness measurements (Figure 2) were performed for all recipients and donors preoperatively. Postoperative outcomes and mortality were recorded during the 30-day follow-up. Abdominal muscle thickness of recipients was compared with donors and correlation calculated with disease severity scoring and postoperative outcomes. Also, ROC curves were used to calculate cut-offs to define sarcopenia using abdominal muscle thickness.

Results and Discussion: The prevalence of sarcopenia in our study population was between 63% to 83%, varying with the method of measurement. Donors had significantly thicker abdominal muscles compared to recipients with cirrhosis. The extent of muscle thinness correlated linearly with the severity of liver disease on CTP score and also independently with the volume of ascitic fluid accumulated. Also, recipients with thinner external oblique and transversus abdominis muscles spent a longer time in the ICU postoperatively

Conclusion(s): A significant difference can be expected in the abdominal muscle thickness of LDLT recipients with cirrhosis and healthy donors. A moderate negative linear correlation exists between CTP score and thickness of transversus abdominis muscle. Lastly, patients found to be sarcopenic on measurement of external oblique and/or transversus abdominis thickness tend to have a longer postoperative ICU stay.

35AP02-7 Assessment for predictors of liver transplantation outcome

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Background and Goal of Study: Multiple factors are related to liver transplantation (LT) outcomes. Among them, the most related are the type of donor, patients' comorbidities, and intraoperative course. We aim to assess which predictors are associated with poor outcomes at 90 days after LT.

Materials and Methods: Single center retrospective study of all consecutive patients undergoing LT from 2008-2018. Exclusion criteria were acute liver failure, living donor and multiple organ transplant. Data related to the type of donor (dead brain donor or donation after circulatory death), surgery and recipient characteristics that reported to be related to allograft failure were collected. We defined graft failure as graft cirrhosis, need for re-LT, and/or allograft-associated death between day 7 and day 90 after LT.

Results and Discussion: 622 patients were included in the analysis and 30 patients fulfilled the criteria for graft failure. After comparing donor type, age, body mass index, Child-Pugh and MELD at LT time, and baseline hemoglobin in the receptor, warm and cold ischemia time, post-reperfusion syndrome and number of red blood cell packages in the intraoperative setting, only the number of RBC administered during the intraoperative period was significantly associated with the incidence of graft failure (p=0.008).

Conclusion(s): Transfusional rate during the liver transplant seems to be the most important risk factor for graft failure between day 7 and 90 after LT. Despite the limitations of our study, anesthesiologists should focus on the development of both hemoglobin level optimization and intraoperative bleeding reduction strategies in order to avoid RBC transfusion.

Urgent liver transplant due to fulminant liver failure of unknown etiology, with acute leukemia diagnosed in the immediate postoperative period

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Background: Acute liver failure is a life-threatening situation; its treatment is based on support measures, treatment of the etiological cause and, in many cases, liver transplantation. However, liver transplantation is contraindicated in terminal situations or extrahepatic cancer.

A fulminant liver failure secondary to acute leukemia diagnosed late in the postoperative period of urgent transplantation is described.

Case Report: 14-year-old patient admitted to our critical care unit due to acute liver failure (MELD 36) of unknown cause with rapid clinical and analytical deterioration developing encephalopathy and severe coagulopathy. An urgent liver transplant was performed 48 hours after admission.

Progressive cytopenia and hyperferrtinemia are observed in the postoperative period. Given these findings, bone marrow analysis was performed in which blast infiltration compatible with acute lymphoblastic leukemia was observed.

Given this finding, a multidisciplinary meeting is held to decide on the initiation of high-dose corticosteroid therapy during admission to the critical care unit, for subsequent treatment with chemotherapy after postoperative recovery. The patient is progressing favorably with a survival of more than 5 years at present. Discussion: In the face of acute liver failure we must look for the different etiological causes. Hematological diseases are a common cause of liver disorders, without normally being life-threatening. However, in the event of liver failure of unknown etiology. we must consider this possibility, since it represents a variation in treatment and a possible contraindication for liver transplantation. In this case, the patient did not show compatible symptoms before the transplant, so an urgent transplant was performed due to liver failure of unknown etiology.

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Litten J, Rodríguez M, Maniaci V. Acute lymphoblastic leucemia presenting in fluminant hepatic failure. Pediatr Blood Cancer 2006; 47: 842-5.

Catalá, Muriel, Ocqueteau T., Mauricio, & Sarmiento M., Mauricio. (2017). Leucemia linfoblástica aguda con grave alteración hepática como manifestación inicial. Presentación de dos casos y revisión de la literatura. Revista médica de Chile, 145(6), 804-807. https://dx.doi.org/10.4067/s0034-98872017000600804 Learning points:

- In the face of acute liver failure we must look for the different etiological cause.
- We must think about hematological diseases in the diagnosis of acute liver failure of unknown etiology.

35AP02-10

The impact of preoperative anemia in liver transplant patients on blood product requirement, intraoperative blood loss and ICU length of stay

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Background and Goal of Study: In cirrhotic patients anemia is frequent, but often neglected disease. In different surgical fields, preoperative anemia was identified as an independent risk factor for post-operative morbidity and mortality, however this topic was less studied in cirrhotic patients undergoing liver transplantation (LTx). The study objectives were to assess the incidence and impact of pre-operative anemia in LTx patients.

Materials and Methods: 300 liver cirrhosis patients undergoing LTx were enrolled. The collected data included: recipient characteristics, preoperative complete blood counts, intraoperative bleeding and transfusion requirements, ICU length of stay (LOS). Results and Discussion: Patients included had mean (±SD) age 49.8 (±11.9) years and mean (±SD) MELD score 18.4 (±7.1) points. According to WHO criteria, 83.7% of patients had preoperative anemia, with 38.7%, 43.7% and 1.3% of patients having mild, moderate and respectively severe anemia. The severity of anemia increased with the severity of the liver disease as assessed by MELD score. Ferritin levels, mean corpuscular volume and hemoglobin were not different between anemic and non-anemic patients. Compared to patients without anemia, cirrhotic patients with anemia had higher red cell distribution width (median(IQR) 16.9(3.7) vs 14.7(2), p<0.001), lower blood iron levels (median(IQR) 85.5(105.9) vs 130.4(77.2), p=0.008), higher intraoperative blood loss and transfusion requirements (median(IQR) 4250(5425) vs 2500(3175)ml; 4(6) vs 1(3) U RBCs, p<0.001), and longer ICU LOS (median(IQR) 6(3) vs 5(2) days, p<0.001).

Conclusion(s): Diagnosis and correction of pre-operative anemia in LTx candidates may reduce intraoperative transfusion requirements and the duration of ICU stay, leading to cost savings for the health service.

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Hemolysis in microwave ablation of small liver tumors: preliminary results from an ongoing RCT

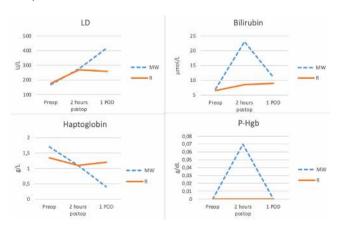
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Background and Goal of Study: Thermal ablation is a minimal invasive treatment of liver tumors, and can be done through radiofrequency (RF) or microwave (MW) ablation. It is well known that hemolysis can occur after ablation in both methods, previously associated with long ablation time of large hepatic tumors and hemangiomas. We here explore the extent of hemolysis after shorter ablation procedures on solid liver tumor metastasis.

Materials and Methods: We included patients from the New Comet study, an RCT comparing laparoscopic resection to thermal ablation of colorectal cancer liver metastasis less than 3cm in size (Clinicaltrials.govID: NCT05129787). 35 patients have been included in the MW-ablation arm, and 39 in the laparoscopic resection arm (R) as a control group.

The hemolysis markers LD, Bilirubin, Haptoglobin and plasma-Hemoglobin (p-Hgb) were analyzed preoperatively, 2 hours postoperatively and on the first postoperative day (1POD). Wattminutes (minutes of ablation X watt) were calculated to test for correlations with each hemolysis marker in the ablation group. We used the Mann-Whitney U test for group comparisons and Spearman's rank correlation test for assessing correlations.

Results and Discussion: Mean tumor size was 14.6 mm (R) and 13.2 mm (MW). We found significantly more hemolysis (p<0.05) in all four markers in the MW group compared to the control group (figure 1), and the extent of the hemolysis correlated with the energy delivered (wattminutes) (range 0.48-0.80, all p-values < 0.05).



Conclusion(s): MW ablation can result in a transient hemolysis even in the treatment of small liver tumors. The amount of energy delivered correlated with the degree of hemolysis. The clinical impact of these findings will be investigated in patient follow-ups.

35AP02-12

Septic versus vasoplegic shock in liver transplant surgery

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Background: During liver transplant surgery, hemodynamic instability usually appears during the graft reperfusion phase. However, it can occur at any phase of the procedure as hemorrhagic shock, cardiogenic shock, septic shock or vasoplegic syndrome (VS), and the differential diagnosis can be difficult.

Case Report: A 60-year-old male, Child C, MELD 28, underwent a second liver transplant due to recurrent hepatitis C and hepatocarcinoma. The dissection phase was difficult and required transfusion of 5 units of red blood cells and 14 units of fresh frozen plasma. The rest of the surgery was uneventful until the end of the neohepatic phase when, without active bleeding, the patient developed hypotension (MAP 45 mmHg, CVP 3 mmHg, PAP 10 mmHg, PCP 6 mmHg, CI 4.7 L/min/m², SVR 622 dyn-s-cm-⁵, HR 97 bpm) that required noradrenaline to achieve a MAP of 60 mmHg.

Postoperatively, the patient suffered hemorrhagic shock due to bleeding from the donor hepatic artery, requiring emergency surgery and numerous transfusions. Intraoperatively, an abscess was identified in the donor hepatic artery (WBC 32,000/µL).

Cultures and liver biopsies were obtained. Subsequently, a prosthetic graft was placed in the donor's hepatic artery due to the absence of arterial flow (arterial thrombosis). The patient progressed to hyperdynamic shock secondary to septicemia caused by Pseudomona aeruginosa of abdominal origin (hepatic infectious arteritis), leading to death.

Discussion: During surgery, the patient had distinctive signs of VS, such as MAP <50 mmHg, PCP ≤10 mmHg, CVP <5 mmHg, CI >2.5 L/min/m². SVR <800 dvn·s·cm-⁵. and elevated HR (1). However, positive cultures from liver biopsies, peritoneal fluid and blood confirmed septic shock as a probable diagnosis. Cardiogenic shock was ruled out because of preserved ventricular function. Anaphylactic shock was considered unlikely, as the vasoplegia was not temporally related to drug administration or transfusions.

References: 1. Clinton TL, et al. Ann Thorac Surg 2000;69:1198-204.

Learning Points: It should be considered that, although VS in liver transplant surgery has been associated with various factors such as surgical trauma, ischemia-reperfusion injury and systemic inflammatory response, its diagnosis is infrequent and typically of exclusion. The occurrence of deep vasoplegia requires early exclusion of septic shock to adjust antibiotic treatment and improve prognosis.

Features of anesthetic management and perioperative intensive care of pediatric liver transplantation

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Background and Goal of Study: Liver transplantation is currently the only effective method for treating liver failure in children at the decompensated stage. Improving surgical techniques, anesthesiological support, and perioperative management have led to a significant increase in survival rates among pediatric patients. even those weighing less than 10 kilograms.

This study aims to analyze the specific aspects of anesthesiological management and perioperative care for pediatric liver transplantation performed in Belarus.

Materials and Methods: We used data from a retrospective analysis of 118 pediatric patients who underwent liver transplantation between 2009 and 2024. The age of patients ranged from 5 months to 17 years, with an average age of 1.5 years. The severity of the disease was assessed using the PELD-score.

We perform between 7 and 13 liver transplants for children each year, with biliary atresia, acute fulminant hepatitis, and hepatoblastoma being the most common indications.

Results and Discussion: When analyzing 118 pediatric liver transplants, we found that improving surgical techniques, such as using a reduced graft and split-transplant techniques, can help avoid the large-for-size syndrome.

This can lead to the development of complications like intraabdominal hypertension and compartment syndrome, as well as impaired venous outflow and graft dysfunction. Cava-portal transposition (n=6) can help revascularize the graft in cases of portal vein thrombosis.

Pediatric liver transplants have several features: high PELD score, high proportion of children under 3 years old (up to 50%), many urgent operations, and a high incidence of infections with multidrug-resistant bacteria (MDR), these operations are performed in a multidisciplinary adult hospital.

We develop an individualized management for each child based on their age, weight, disease status, functional impairments, and infectious status.

Conclusion(s): As a result of this approach, we obtained data on survival rate for children is 87.5% and the three-vear survival rate is 80.5%. The hospital mortality rate is 11.1%. The most common complications in the early postoperative period included renal dysfunction requiring renal replacement therapy (15.6%), neurological complications (12.5%), respiratory complications (9.4%). sepsis (9.5%), toxicity from calcineurin inhibitors (9.4%), cardiovascular complications (6.3%) and pulmonary embolism (PE) (3.1%).

Drugs and Pharmacology

41AP01-1

Effects of intranasal insulin on Postoperative Delirium in elderly patients with type 2 diabetes mellitus: a secondary analysis of a randomized clinical trial

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Background and Goal of Study: Postoperative delirium (POD) is prevalent among older patients with type 2 diabetes mellitus (T2DM). Our previous study showed that intranasal insulin was a potential therapy to prevent POD in older patients¹. Therefore, a secondary analysis was employed to investigate the effects of intranasal insulin on POD in older patients with T2DM.

Materials and Methods: In the previous clinical trial, 128 patients undergoing elective orthopedic or pancreatic surgery with general anesthesia were randomised to intranasal administration of 40 IU insulin (Group I) or equal volume of normal saline (Group S), respectively, once daily from 5 minutes before anesthesia induction until 3 days postoperatively¹. For the current study, 50 diabetic patients (22 and 28 participants in Group S and Group I, respectively) were included. The primary outcome was POD incidence within the 3-day postoperative period in different groups. The secondary outcomes were the perioperative score changes of the Mini-Mental State Examination (MMSE) and Montreal Cognitive Assessment-Basic (MoCA-B), postoperative levels of interleukin-6 (IL-6), tumor necrosis factor α (TNF- α), S100- β , and Creactive protein (CRP) in different groups. Statistical differences between groups were determined using Student's t-test or Fisher's exact test for quantitative data or categorical data, respectively. P values < 0.05 were regarded as statistically significant.

Results and Discussion: As shown in table 1, Insulin treatment significantly decreased the incidence of POD in Group I than in Group S (P=0.042), increased postoperative MMSE (P=0.045) and MoCA-B (P=0.027) scores in group I than in group S. And the postoperative serum levels of CRP (P=0.058) and IL-6 (P=0.061) in Group I were lower than in Group S.

	POD	Baseline MMSE	Postope- rative MMSE	Baseline MoCA-B	Postope- rative MoCA-B	Serum TNF-α (pg/ml)	Serum S100-β (ng/ml)	Serum CRP (mg/dl)	Serum IL-6 (pg/ml)
Group S	8 (36.4%)	27.4 (1.9)	27.1 (2.4)	23.5 (2.4)	23.4 (3.0)	62.61 (14.72)	5.00 (1.45)	8.3 (7.2)	38.4 (9.5)
Group I	3 (10.7%)	27.4 (1.6)	28.1 (1.2)	24.0 (2.3)	25.0 (2.3)	63.11 (13.68)	5.03 (1.37)	4.8 (5.2)	33.0 (10.0)
P value	0.042*	0.917	0.045*	0.458	0.028*	0.902	0.955	0.058	0.061

Table 1.

Conclusion(s): Intranasal insulin therapy holds promise as a potential treatment for POD in elderly patients with T2DM. This study provided the basement for conducting a large-sample size study to further validate these results.

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41AP01-2

Effect of an intravenous bolus of LIDOCAINE on the estimated median effective concentration (EC50) of PROPOFOL during target-controlled intravenous anesthesia (TCIVA: Schnider model) for performing gastroscopy: a prospective. randomized, double-blind study

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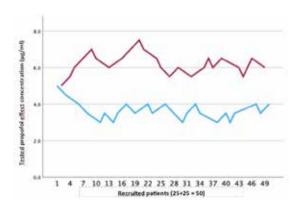
Background and Goal of Study: Gastroscopy often requires sedation to enhance patient comfort and improve examination quality. Propofol is the preferred sedative, but adjuncts like lidocaine may reduce its adverse effects.

This study evaluates the impact of an intravenous lidocaine bolus on the estimated median effective concentration of propofol during target-controlled intravenous anesthesia in gastroscopy.

Materials and Methods: This single-centre, prospective, randomized, double-blind, placebo-controlled study involved 50 adults scheduled for propofol sedation during gastroscopy. Participants were randomized into two groups: the lidocaine group received 1.5 mg/kg of intravenous lidocaine, while the placebo group received saline. Propofol concentration was adjusted based on the success of gastroscope insertion.

The primary endpoint was the median effective concentration of propofol, with secondary endpoints including total propofol consumption, side effects, and recovery time.

Demographic characteristics	Lidocaïne group	Placebo group	P-value
Age (years)	43.12 ± 13.55	39.6 ± 11.39	0.33
Gender (M/F)	11/14	13/12	0.57
Weight (kg)	70.04 ± 12.04	72.84 ± 13.98	0.46
Height (cm)	168.92 ± 9.38	169.36 ± 12.04	0.89
IMC (kg/m²)	24.48 ± 3.36	25.31 ± 3.61	0.40
ASA score (I/II)	5/20	4/21	0.72



Results and Discussion: The median effective concentration of propofol was 3.5 µg/mL [3.2; 3.8] in the lidocaine group versus $6.3 \,\mu\text{g/mL}$ [4.8; 7.9] in the placebo group (p < 0.01). The lidocaine group demonstrated lower total propofol consumption, fewer instances of desaturation and hypotension, reduced burst suppression episodes, less injection pain and cough, and quicker recovery times. No serious adverse events occurred.

Conclusions: An intravenous lidocaine bolus effectively reduces peak propofol concentration and its side effects, while also decreasing total propofol consumption and providing faster recovery wich seems advantageous for ambulatory anesthesia.

41AP01-3

Clinically significant recurarisation in the postanaesthesia care unit after robotic surgery with antagonism of rocuronium with sugammadex controlled by neuromuscular monitoring. A case report

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Background: When the patent on sugammadex expired in 2023, it seemed that the problems of residual neuromuscular blockade had been overcome. However, once the use of drugs increases, there is an inevitable risk that very rare, not yet widely recognised, side effects will come to light, especially if imprudence rises[1-3]. Case Report: A 41-year-old female patient with no relevant comorbidities except obesity and hypothyroidism underwent robotassisted, laparoscopic surgery for 8 hours. Anaesthesia was induced with sufentanil, propofol, and rocuronium, followed by TIVA. Rocuronium was administered continuously via perfusor and stopped 30min before the end of surgery. At a TOF count of 2, antagonisation was performed with 200 mg sugammadex (2.4 mg/kg), resulting in a TOF ratio >90% and uneventful extubation. 45 min after admission to the PACU, the patient became somnolent and desaturated to an oxygen saturation of 60%. Oxygen was administered and an oropharyngeal tube was placed, which led to a rise of saturation to 95%. The patient's systolic blood pressure rose to 220 mmHg and a shallow breathing pattern was noticed. Immediate TOF count of 2 confirmed the suspected recurarisation. After an additional dose of sugammadex (200mg), the patient stabilised rapidly and was asymptomatic without oxygen few minutes later. In a debriefing, she stated that she could not remember the incident and gave written consent to publication of the case.

Discussion: After high doses of rocuronium, a sufficient TOF ratio for extubation may be achieved with sugammadex, but many receptors might still be blocked, as a reduction in muscle strength starts if >70% of the nicotinic acetylcholine receptors of the motor endplate are occupied. A small amount of rocuronium molecules redistributing from peripheral compartments after sugammadex has been excreted could be sufficient to reestablish a higher degree of neuromuscular blockade[3].

Although the pharmacological causes may be different from traditional recurarisation after antagonisation with acetylcholinesterase inhibitors, the potential for varying degrees from unrecognised events to life-threatening hypoxia remains[1-3].

References:

- 1. Dubois BFH, BJA 2023
- 2. Todd MM, Anesthesiology 2023
- 3. Hunter JM, BJA 2024

Learning Points: Adequate dosing of blocking agents and their antagonists as well as focussed attention and pharmacological knowledge remains mandatory.

We recommend prolonged monitoring of patients antagonised with sugammadex.

41AP01-4

The dilemma of choosing safe anaesthetic medicines for a patient with Brugada syndrome needing vitrectomy! If the same patient needs a laparotomy, what pharmacological agents should vou choose?

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Background: Brugada syndrome accounts for approximately 40% of cases of sudden cardiac death (polymorphic VT or VF) in patients with structurally normal heart1.

Case Report: 63 year old man with Brugada syndrome, hypertension and hypercholesterolemia was booked for vitrectomy. He denies any cardiac symptoms or family history of SCD. His 12 lead ECG shows typical Type 1 pattern that is diagnostic of Brugada syndrome. TTE shows normal LV, EF 60-65%, dilated LA and mild AR. Abnormal Holter with dominant rhythm sinus, 3000 episodes of bradycardia (lowest 27/min) and occasional ventricular ectopic. Procedure was done under a sub-tenon's block with Lignocaine and adrenaline. Patient had 4 hour ECG monitoring in Recovery and was discharged next morning.

Discussion: Propofol and Bupivacaine are on the Red list (avoid) for patients with Brugada syndrome². Lignocaine, Amiodarone, Tramadol, Metoclopramide and Ketamine are on the orange list (preferably avoid)2. Limited evidence is available about anaesthesia for patient with Brugada syndrome. Isoprenaline is the only recommended pharmacological option (should be readily available) and an aim to increase heart rate by 20%1. No definite recommendation for preference between general or regional anaesthesia. Discuss with Cardiology and ITU. If GA is given, then post-operative monitoring for at least 36 hours (5 half- lives of medicines). Monitoring: Continuous 5 lead ECG, BIS, Temp, neuromuscular monitoring, BP (+/-Arterial) and SPO2. Team briefing and preparation. Caution with Vagotonic manoeuvres (e.g pneumoperitoneum, neck surgery) bradycardia precipitates VT/VF. Avoid hyperthermia3.

If GA is necessary (e.g. laparotomy), safer drugs are Thiopentone, Fentanyl, Sevoflurane, NDMR, Paracetamol, NSAIDs, Dexamethasone, Ondansetron and Sugammadex.

References:

- 1. Levy D et al 2018, Anaesthesia for patients with hereditary arrhythmias part 1 Brugada syndrome, BJA 18(6) p 159-165
- 2. Webpage BrugadaDrugs.org (Department of Cardiology, University of Amsterdam) available at

www.brugadadrugs.org

3. Martorano P et al, 2022, Anaesthesia for Brugada syndrome, The Orphan anaesthesia (German Society of Anaesthesiology/ ICM)

Learning Points: Anaesthetists should be aware of Brugada syndrome; "safer" anaesthetic medications, important role of Isoprenaline and peri-operative monitoring for Brugada syndrome. Red and Orange list of drugs for patients with Brugada syndrome has anaesthetic medications in them.

Poisoning with calcium channel blockers and beta blockers drugs

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Background: The patient who was old 22 years, was diagnosed with bipolar disorder and had a five month pregnancy five month ago, afterwards she didn't go for a check up.

Case Report: The patient was found at home beside two boxes of beta blockers and two boxes of calcium channel blokers as empty. She was confused, hypotension (systolic blood pressure :70-74mmhg, diastolic blood pressure :30-32 mmhg) and bradhicardia (40-42 heart rate and this is the nodal rhytym), restricted diuresis when she brought to hospital.

Gynecological examination did not show the pregnancy. The patient was intervened with activated carbon, 0.2 ml/kg calcium chloride, 0.03 mg/kg glukagon, inotrop drugs (adrenalin and noradrenalin), insulin and dextrose.

Appropriate average arterial pressure and pulse can not sustain despite all treatments. The patient was consultated with cardiology department. Transvenous pacemaker was planned and inserted

The patient was taken to Intensive Care Unit and hemodynamic stabilization was restored. Dialysis was performed in the Intensive Care Unit. Durind these treatments, the patient's hemodynamic, vital signs, all system examination, especially neurologic, improved over time.

The pacemaker was controlled by cardiolog. Pacemaker was removed three days later when the patient's hemodynamics improve. At the finally the patient was discharged from Intensive Care Unit to service.

Discussion: We must quickly assess the patient's response to treatment in order to reach vital physiological values as soon as possible. The protocols should be applied carefully on poisoning of beta blockers and calcium channel blocker drugs.

We intend to emphasize the importance of applying mechanical support treatment (transvenous pacemaker, dialysis, ECMO etc) in time when there is no response.

Reference:

https://dergipark.org.tr/en/download/article-file/2243554 Learning Points: Poisoning, calcium channel drug, blocker beta blocker drug, transvenous pacemaker, dialysis.

41AP01-7 Effect of donepezil on the onset and duration time of neuromuscular blocking agent

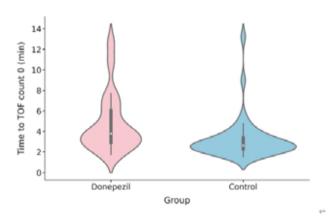
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Background and Goal of Study: Donepezil, an acetylcholinesterase inhibitor, is prescribed to enhance memory and cognitive function in dementia patients, aiming to increase acetylcholine levels and slow disease progression. This drug's mechanism suggests potential interactions with nondepolarizing neuromuscular blocker used during anesthesia. This study examines the influence of donepezil on the action of nondepolarizing neuromuscular blockers, hypothesizing that donepezil administration will prolong the onset and reduce the duration of blocker effects.

Materials and Methods: This study was designed as a prospective, matched case-control, observational study approved by the IRB of author's hospital (CNUHH-2021-033) and registered at the CRIS of the Korean NIH(https://cris.nih.go.kr; KCT0005979). The study enrolled 20 dementia patients taking donepezil (Group D) and 40 controls (Control group). Anesthesia was induced and maintained with TIVA TCI. Neuromuscular blockade was monitored by electromyography with TwitchView, assessing the depth by TOF every 15 seconds and the PTC every 6 minutes. Rocuronium (0.9 mg/kg) was administered intravenously. Primary outcome was the time to TOF count 0 after rocuronium administration. Secondary outcomes included recovery times to TOF counts

Results and Discussion: Group D had an average donepezil dose of 5 mg over a 24-month duration. The time to TOF count 0 was significantly longer in Group D, with a mean of 3.61 minutes, compared to the control group's 2.63 minutes (P= 0.006). Recovery to TOF count 1 was notably quicker in Group D, averaging 31 minutes, versus 50.24 minutes (P<0.001) in the control group. Recovery to TOF count 4 also showed a significant difference between Group D averaging 53.67 minutes and the control group averaging 71.05 minutes (P = 0.002).

Figure 1. Violin plots of onset times for neuromuscular blockade #



This figure illustrates the time to reach a train-of-four (TOF) count of 0 following the administration of rocuronium, which measures the onset of neuromuscular blockade. The donepezil group shows a significantly longer time to TOF count 0, indicating a delayed onset compared to the control group (p = 0.006).

Conclusion: The study indicates that donepezil affects the pharmacodynamics of rocuronium by prolonging its onset time and shortening recovery duration. These findings suggest the need for careful dose adjustment of neuromuscular blockers in the anesthetic management of dementia patients taking donepezil to ensure safe and effective anesthesia.

Comparison of hypotensive events during general anesthesia induction with remimazolam vs. propofol: a retrospective study

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Background and Goal of Study: Remimazolam is a novel shortacting benzodiazepine general anesthetic. It is said to have advantages over traditional drugs like propofol, such as less impact on hemodynamics and reduced respiratory suppression. In this study, we retrospectively investigated the use of remimazolam in our hospital and examined whether the occurrence of hypotension during the induction of general anesthesia differed between remimazolam and propofol.

Materials and Methods: After obtaining approval from the hospital's ethics committee, data were extracted for patients who underwent general anesthesia in our hospital between October 1, 2023, and March 31, 2024. Patients under the age of 18, those who were induced with anesthetics other than remimazolam or propofol, and those who experienced anaphylactic shock or other forms of shock during anesthesia induction were excluded. Hypotensive events during anesthesia induction were defined as either a mean blood pressure below 60 mmHg or the use of vasopressors. Basic patient information, the occurrence of hypotensive events, induction anesthetic, history of hypertension, and history of diabetes were extracted from electronic medical records and anesthesia records. Logistic regression analysis was used to evaluate whether the type of induction anesthetic was related to the occurrence of hypotensive events.

Results and Discussion: Among 498 patients, hypotensive events occurred in 197 cases. Remimazolam was used in 258 cases. The incidence rates of hypotension with remimazolam and propofol were 38.0% and 41.4%, respectively, with no significant difference observed. Logistic regression analysis, including variables such as the type of induction anesthetic, age, ASA-PS, history of hypertension, and history of diabetes, revealed no factors significantly associated with the occurrence of hypotension. Patients who were administered remimazolam were significantly older and had a significantly higher incidence of hypertension and diabetes.

Conclusion(s): The occurrence of hypotensive events during the induction of general anesthesia was not related to the type of anesthetic used, whether remimazolam or propofol.

41AP01-10

The effects of topical pharyngeal anaesthesia on patient tolerance and recovery time following gastroscopy under sedation

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Background and Goal of Study: In Australia, elective gastroscopies typically involve intravenous sedation, sometimes supplemented with topical pharyngeal anaesthesia (TPA). Previous studies have produced mixed results regarding the benefits of TPA. This study aimed to evaluate patient tolerance and recovery experience by objectively measuring the procedural smoothness and recovery time, comparing between patients who received TPA and those who did not.

Materials and Methods: A prospective cross-sectional study was conducted between November 2021 and March 2024. Informed consent was obtained from a convenient sample of adult patients undergoing elective gastroscopy, baseline patient and anaesthetic data, procedural smoothness and recovery time were then recorded. Procedural smoothness was measured by the incidence and severity of desaturations, body movement, and procedural interruptions; and recovery time was measured by 1) the time spent in the post-anaesthetic care unit (PACU) until eating and/or drinking (E+D); and 2) until PACU discharge. Descriptive statistics and the Student's T Test were used to compare between the two

Results and Discussion: Of the 70 included patients, 39 (56%) received TPA, baseline characteristics were comparable between the groups. Propofol was the mainstay of sedation, adjunct medications included midazolam, alfentanil and fentanyl. Desaturation occurred in seven patients: four significant (<90%) and three mild (<95%). All desaturations, except one significant event, occurred in the group without TPA. Coughing, the most common form of body movement, was noted in 14 procedures (20%), slightly more frequent in patients not receiving TPA. Recovery times were longer in the TPA group, with patients taking an average of 47minutes to E+D compared to 39 minutes without TPA (p = 0.02), and 74 minutes to discharge compared to 58 minutes without TPA (p

Conclusion(s): The addition of TPA appeared to improve patient tolerance during gastroscopy by enhancing the procedural smoothness However, it significantly delayed patient recovery and discharge, leading to increased demands on hospital resources and higher costs. Given that this study was conducted in a small hospital with a limited sample size, the generalisability of these results is uncertain. As such, larger-scale studies are necessary to validate these findings.

Hemodynamic effect of remimazolam compared with sevoflurane in thoracic surgery

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Background and Goal of Study: Remimazolam is a short acting benzodiazepine. It is known that benzodiazepines had little effect on hemodynamics. Here we retrospectively compared the hemodynamic effect of remimazolam with that of sevoflurane during general anesthesia with epidural anesthesia undergoing video assisted thoracoscopic surgery (VATS).

Materials and Methods: After approval of our local ethical committee (#2021071), we enrolled 174 patients who had undergone VATS for lung cancer. Remimazolam group (RM; 2020/10-2021/05) was 86 cases and sevoflurane group was 88 cases (SV; 2020/01-2020/06). After arrival in the operating room, epidural catheter was placed at T5/6 or T6/7. In RM group, anesthesia was induced with remimazolam infusion at 1.5-2.5 mg/kg/hr. In SV group, anesthesia was induced with propofol 1.0-1.2 mg/kg. After that 3-4 mcg/kg of fentanyl and 0.6 mg/kg of rocuronium was administered and a proper size of double-lumen endobronchial tube was intubated and arterial catheter was placed at either side of radial artery and arterial blood pressure was continuously monitored.

In RM group, anesthesia was maintained by remimazolam. Infusion rate was adjusted by observing raw EEG waveform on the BIS monitor. In sevoflurane group, anesthesia was maintained with sevoflurane at expired concentration of 1.1-1.3%.

For epidural analgesia, 1% lidocaine (7-9 mL) was given initially, followed by 0.25% levobupivacaine (7-9 mL) 30 minutes later. Levobupivacaine (5-7 mL) was then administered every 50-70 minutes.

If systolic blood pressure dropped below 70-80 mmHg, either ephedrine (4 mg) or phenylephrine (0.1 mg) was given, with the choice left to the anesthesiologist. We compared the frequency of intraoperative vasopressor use (per hour) between the two groups. Statistical analyses included Student's t-test for parametric data and the Mann-Whitney U test for non-parametric data.

Results and Discussion: We excluded 4 cases in SV group and 3 cases in RM group, as they required dopamine infusion. Demographic data were similar and no significant difference was found. Frequency of vasopressor use was 0 [0, 0.97] in RM group and was significantly less compared with 1.55 [0.65, 2.90] in SV group (median [25th, 75th]). 48 cases (57.8%) in RM group were vasopressor free while 8 cases (9.5%) in SV group.

Conclusion(s): Decrease of blood pressure was much less in remimazolam anesthesia compared with that in sevoflurane anesthesia even with thoracic epidural anesthesia.

41AP02-1

Case report: efficacy of capsaicin 8% (Qutenza) in the treatment of acute intercostal neuropathic pain post-removal of thoracic drainage tube

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Background: Intercostal neuropathic pain (INP) following the removal of an endothoracic tube is a common problem that can delay discharge and increase patient morbidity. Effective pain management is crucial, particularly in cases refractory to conventional therapies

This report illustrates the successful use of Qutenza (capsaicin 8%) applied perilesionally in a patient with severe INP, achieving immediate analgesia, discontinuation of systemic analgesics, and timely discharge.

Case report: A 73-year-old woman was admitted to the internal medicine unit with disabling right chest pain. Two weeks earlier, she underwent surgery for a rib fracture and hemothorax, which required the placement and subsequent removal of an endothoracic drainage tube. Despite treatment with NSAIDs, opioids, and anticonvulsants, her pain persisted at 10/10 on the Numerical Rating Scale (NRS), severely impairing her quality of life and delaying discharge. The acute pain unit proposed perilesional application of Qutenza. After preparing the area with topical lidocaine 4%, the capsaicin patch was applied to the affected intercostal region. Within 24 hours, a significant pain relief (1/10 NRS), enabling the discontinuation of systemic analgesics, was reported allowing her to be discharged home.

Discussion: This case demonstrates the efficacy of Qutenza in managing refractory INP. The rapid onset of analgesia aligns with evidence suggesting capsaicin patches are a viable alternative to systemic therapies. Although guidelines often recommend topical treatments as second-line options, recent studies have shown that capsaicin patches can outperform oral agents such as pregabalin in localized neuropathic pain (1).

Emerging algorithms for treating localized neuropathic pain increasingly propose topical analgesics, including capsaicin patches, as first-line options, particularly for patients who cannot tolerate systemic therapies (2).

References:

1. Haanpää M, Cruccu G, Nurmikko TJ, McBride WT, Docu Axelarad A, et al. Capsaicin 8% patch versus oral pregabalin in patients with peripheral neuropathic pain. Eur J Pain. 2016;20:316-28.

2. Allegri M, Baron R, Hans G, Correa-Illanes G, Rojals VM, et al. A pharmacological treatment algorithm for localized neuropathic pain. Curr Med Res Opin. 2016;32:377-84.

Learning points: Perilesional application of capsaicin should be considered a viable and effective option for managing post-operative acute neuropathic pain, especially in refractory cases.

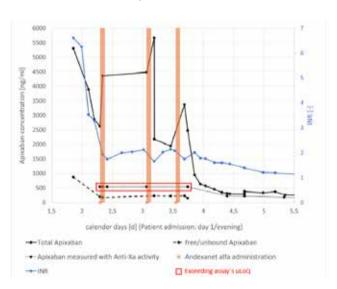
Concentration-time course of Apixaban after a massive overdose and repetitive treatment with Andexanet alfa – a case report

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Background: Ondexxya^R (Andexanet alfa) is used to antagonise direct Xa inhibitors, e.g. apixaban, but has a shorter effective halflife (1). We report a case of massive apixaban poisoning and lifethreatening intraabdominal hemorrhage.

Case report: A man in his 50s presented with self-inflicted stab wounds and hemorrhagic shock. He was on apixaban for atrial fibrillation. Surgical exploration revealed intraabdominal bleeding. Coagulation parameters suggested relevant apixaban activity. Conventional procoagulatory treatment was applied (PPSB, fresh frozen plasma, platelets), but bleeding persisted, necessitating abdominal packing. An automated chromogenic anti-Xa-assay showed supratherapeutic levels exceeding the uLoQ (>541.3 ng/ mL). Ondexxya^R was administered (800mg bolus + 960mg/2h). Clinical signs of bleeding decreased only temporarily, so Ondexxya^R was repeated after 18h. A third dosage of Ondexxya^R was given prior to depacking. Post-treatment analysis by isotope dilution LC-MS/MS revealed initial apixaban plasma concentrations of 5302 ng/mL (~20 to 80 fold therapeutic range) (2). Concentrations fell below 500 ng/mL only by day 4. Administration of Ondexxya^R were immediately followed by a transient increase in total apixaban concentrations and a drop of INR. No effect could be detected on unbound apixaban concentrations or elimination.



Discussion: Ondexxya^R appears to be effective also in massive overdosing, but may necessitate repeated administration. Combination with eliminatory strategies (e.g. plasmapheresis) might be reasonable.

References:

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Learning points: Andexanet alfa can stabilize bleeding in massive apixaban overdose but may require repeated dosing and adjunctive therapies.

Suicide attempts can include "synergistic" strategies.

41AP02-3 Remifentanil - a case of profuse sweating

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Background: Diaphoresis during general anaesthesia (GA) is uncommon and the differential diagnosis can be challenging as multiple factors may play a role.1 Adverse drug reaction may be a potential cause. In this case report we present diaphoresis as a possible adverse reaction to remifentanil during total intravenous GA.

Case report: An 83-year-old male, ASA IV, was scheduled for total gastrectomy for adenocarcinoma. Past history included hypertension, dyslipidemia and moderate aortic stenosis. No allergy history. Total intravenous GA was chosen with Propofol and Remifentanil, titrated to bispectral analysis values between 40-60 and hemodynamic stability. Induction with orotracheal intubation was uneventful. After 30 minutes, the patient began to sweat profusely. In a systematic ABCDE approach, there were no ventilatory changes, the patient was hemodynamically stable with isochoric and isoreactive pupils, normoglycemic, apyretic and with no skin alterations. Depth of anaesthesia and infusion systems were adequate. Remifentanil was suspended and 15 minutes after, the profuse sweating stopped.

Discussion: Diaphoresis seldom occurs during GA and the differential diagnosis comprises several factors such as thermal overheating through excessive draping, metabolic or respiratory disturbances (thyrotoxicosis, hypoglycaemia, pheochromocytoma, hypoxia or hypercarbia), autonomic dysfunction and inadequate depth of anaesthesia.1 In this case, after exclusion of other causes using an ABCDE systematic approach, an adverse drug reaction was suspected as the diaphoresis ceased after suspending remifentanil perfusion. Remifentanil is an ultrashortacting synthetic opioid receptor agonist indicated for intravenous administration as an analgesic agent during the induction and maintenance of GA. Although the most common side effects during GA are bradycardia and hypotension, diaphoresis has been described when used for monitored anaesthetic care.2

References:

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- 2. Lauwers M, et al. The safety and effectiveness of remifentanil as an adjunct sedative for regional anesthesia. Anesth Analg. 1999;88(1):134-140

Learning points:

- An ABCDE systematic approach to intraoperative complications is important for diagnosis.
- Diaphoresis is rare under GA and has been described as a Remifentanil adverse reaction.

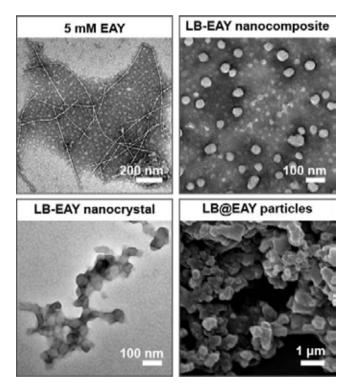
41AP02-4

Levobupivacaine interacting with a self-assembling peptide to form a slow-releasing formulation for long-acting analgesia

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Background and Goal of Study: Moderate to severe postoperative pain usually lasts 48-72 hours 1. Thus, there is a high need for long-acting analgesia in clinic. Local anaesthetics (LAs) were commonly used in the management of pain due to their fast-onset, low toxicity and non-addictiveness. To achieve long-term analgesia, slow-releasing formulations of LAs have been extensively studied.

Materials and Methods: We designed a self-assembling peptide EAY which was negatively charged as the carrier of levobupivacaine (LB). Thioflavine (ThT)-binding test, and transmission electron microscopy (TEM) were applied to characterise EAY. EAY was further used to encapsulate LB to prepare formulation in a bottom-up strategy. The morphology of LB@EAY particles was observed under scanning electronic microscope (SEM) and the releasing profile of drug particles in vitro was studied using the dialysis method. In addition, the analgesia efficacy of formulations was evaluated in rat sciatic nerve block (SNB) model.



Results and Discussion: EAY at the concentration of 5 mM could self-assemble into nanofiber in solution. EAY could interact with LB in solution to form nanoparticles through charge attraction, which could further form nanocrystal by alkalizing pH. LB@EAY formulation showed milky suspension and was composed of uniform nanoparticles. In the SNB model, each rat received a single injection of 0.2 ml of drugs. The nerve block duration for 4% LB@ EAY formulation lasted for 20.25 ± 7.42 hr. which was significantly longer than that for 0.75% LB hydrochloride (4.00 ± 1.11 hr) and 1.33% bupivacaine liposome (4.67 ± 1.51 hr). In addition, local injury scores for 4% LB@EAY including inflammatory cell infiltration, myocytotoxicity and axonal degeneration at 4 and 14 days after injection were similar to those for 0.75% LB hydrochloride. indicating the safety of formulation.

Conclusion(s): The self-assembling peptide EAY could high efficiently encapsulate LB to form stable slow-releasing formulation with long-acting nerve block.

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41AP02-5

Induction of general anesthesia during elective surgery in adults: A randomized, double-blind, phase 3 study of HSK3486 vs propofol (HSK3486-309)

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Background and Goal of Study: HSK3486 is a phenol-derivative, nonbarbiturate, injectable emulsion for IV anesthesia with fast onset and rapid, stable recovery. HSK3486 is in clinical development in Europe and the US, and approved for induction of general anesthesia in adults in China. The primary objective of HSK3486-309 (phase 3 study in Poland, Spain, and the US; NCT05486416) was to investigate the noninferiority of HSK3486 vs propofol in successful induction of general anesthesia.

Materials and Methods: The primary endpoint of HSK3486-309 (multicenter, randomized [2:1], double-blind, propofol-controlled study) was successful induction defined as Modified Observer's Assessment of Alertness/Sedation score ≤1 after study drug administration, ≤1 top-up dose, and no rescue drug use. Success rate differences and 95% CIs were calculated using Farrington-Manning, with a -8% noninferiority margin. Key secondary endpoints were injection-site pain on the Numerical Rating Scale (NRS) and a composite of successful induction with maintained anesthesia depth, without substantial cardiac and respiratory events. Subgroup analyses of the American Society of Anesthesiologists physical status classification I-II and III-IV, ages <65 and ≥65 years, and body mass index <35 and ≥35 kg/m² were also conducted. Safety endpoints included adverse events, abnormal vital signs, and electrocardiogram findings.

Results and Discussion:Of 465 randomized participants, 445 were anesthetized and included in the efficacy analyses (HSK3486, n=300; propofol, n=145). Successful induction was

patients

achieved in 298 (99.3%) participants with HSK3486 and 143 (98.6%) with propofol. The difference in success rates was 0.7% (95% CI. -2.62% to 4.04%: P<.001). HSK3486 was noninferior to propofol for successful induction.

HSK3486 and propofol had similar induction success rates in all subgroups, with 100% successful induction in the ≥65 years sub-

At least mild pain (NRS ≥1) during injection was reported by 19% of HSK3486 participants and 59% of propofol participants (P<.001). The proportion with successful induction for the composite endpoint was 27% with HSK3486 and 31% with propofol (P=.425). HSK3486 and propofol were well tolerated.

Conclusion(s):HSK3486 was noninferior to propofol for successful induction, meeting the primary endpoint of this study. HSK3486 was associated with significantly less pain on injection vs propofol. HSK3486 and propofol had similar success rates for induction in subgroups.

41AP02-6 Intrahospital oral benzodiazepine use in surgical

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Background and Goal of Study: Oral benzodiazepines used for treatment of insomnia and anxiety are widely used in the general population. Data regarding benzodiazepine use during hospitalization is scarce, especially in the surgical department. The goal of this study was to determine the prevalence of intrahospital oral benzodiazepine use in the surgical population of a tertiary care center.

Materials and Methods: A retrospective cohort study was conducted using routinely collected healthcare data in Erasmus University Medical Center in Rotterdam, the Netherlands. Main outcome measure was prevalence of oral benzodiazepines usage during hospitalization at surgical wards. Secondary outcomes were benzodiazepine consumption in Defined Daily Doses (DDD)1 and adjusted odds ratios for sex, and readmission to a surgical ward.

Results and Discussion: 10,896 patients representing 14,928 admissions were included in this cohort, corresponding to all adult surgical patients admitted between September 2018 and September 2022. Median age was 62 (50-72) and 8,761 out of 14928 (58.9%) were male. Prevalence of benzodiazepine administrations in the surgical department was 21.6%. Temazepam (33%), oxazepam (24%), zopiclone (19%) and lorazepam (13%) were prescribed most often. Median number of tablets given during hospital stay was 3 (interquartile range 1-7). The most consumed benzodiazepines during the study period (in DDD) were temazepam (4032), zopiclone (3991), lorazepam (1221) and oxazepam (968). Female patients were more likely to have been administered a benzodiazepine, with an adjusted odds ratio (OR) of 1.09 (95% confidence interval 1.00 to 1.19). Benzodiazepine administration during admission was positively associated with higher 30-day surgical readmission, with an adjusted OR of 1.37 (1.22 to 1.54).

Conclusion(s): 21.6% of surgical patients uses an oral benzodiazepine during hospital stay. Oral benzodiazepine use is associated with the female sex and surgical readmission.

References:

WHO Collaborating Centre for Drug Statistics Methodology. ATC/DDD Index 2024. https://atcddd.fhi.no/atc ddd index/ (accessed 25th of November 2024.

41AP02-8 Intrathecal fluorescein in suspected cerebrospinal fluid leak

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Background: Cerebrospinal fluid (CSF) leaks can occur spontaneously or as a consequence of skull base tumors, trauma, or surgery. In most cases, surgical treatment is essential, with high success rates. Accurate confirmation of the leak and its precise location is crucial. However, even after imaging studies, the exact site often remains uncertain. Intrathecal fluorescein (IF) stains the CSF with a fluorescent green color and can be useful for detecting CSF leaks. Although historical concerns regarding its safety have limited its use, recent studies have shown that low doses of IF are safe and effective.

Case Report: A 31-year-old woman, ASA II, with a history of nasal surgery complicated by a CSF fistula, repaired using fibrin glue. Years later, she underwent resection of an ethmoidal meningocele in the context of bacterial meningitis. One month after surgery, she presented with complaints suggestive of CSF rhinorrhea. Imaging studies were inconclusive in identifying or excluding the presence of a CSF fistula. The patient was thus scheduled for nasal endoscopic surgery to exploration.

TIVA was performed with neuromuscular relaxation and orotracheal intubation, under standard ASA monitoring, BIS™, TOF, and INVOS™, without complications. The patient was placed in the left lateral decubitus, and a lumbar puncture was performed using a 25G Quincke needle. 10mLs of CSF were aspirated, mixed with 25mg of fluorescein, and administered into the subarachnoid

The entire nasal cavity was examined, including during a Valsalva maneuver, without confirming contrast leakage and ruling out the presence of a fistula. It was concluded that there was no indication to proceed with surgery. The patient experienced an episode of urinary retention after the procedure, which resolved with catheterization. No further complications were reported.

Discussion: This clinical case aims to support the use of IF as a simple and safe technique for the detection of CSF fistulas. Despite its off-label use, it represents a valuable tool, to guide and avoid surgical procedures. When recommendations are followed, the side effects with this technique are minimal.

References:

Karan Jolly et al., The efficacy and safety of intrathecal fluorescein. Safe intrathecal fluorescein-Rev Esp Anestesiol

Learning points: The identification and localization of CSF fistulas can be challenging and IF is useful in their detection. When recommendations are followed, the administration is safe.

41AP02-9

To stay or not to stay: a quality improvement project evaluating the effect of Prilocaine on unplanned admissions in day surgery

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Background and Goal of Study: Results from our previous audit identified a concerning rate of unplanned admissions following day-case procedures at our institution where the only available intrathecal agent was Bupivacaine. We hypothesised that the use of short-acting intrathecal agents, such as Prilocaine, could reduce the incidence of these admissions. Prilocaine was subsequently introduced to the anaesthetic formulary, and a re-audit was carried out.

Materials and Methods: We conducted a retrospective analysis of all patients who received spinal anaesthesia as their primary anaesthetic modality at Lister Hospital between August 2023 and April 2024. Only Prilocaine and Bupivicaine were available as intrathecal agents during this period. Patient records were reviewed to identify unplanned hospital admissions, the intrathecal agent used, and any anaesthesia-related causes. These data were compared to our previous audit.

Results and Discussion: Of the 486 patients who received spinal anaesthesia as a primary anaesthetic modality, 74 were planned day cases. Prilocaine was used in 42 (56.8%) cases, and Bupivacaine in 32 (43.2%). Eleven (14.9%) patients required unplanned admissions, of which 3 (4.0%) were attributable to anaesthesiarelated causes. Two cases were associated with the use of Bupivacaine, and one with Prilocaine. Compared to our previous audit, we observed a 1.2% reduction in unplanned admissions

Our findings align with larger studies highlighting Prilocaine's potential to accelerate patient recovery and discharge, but our results do not show as clear a benefit as expected. In light of these findings, we are in the process of developing clear guidance for using Prilocaine in this setting and intend to conduct educational sessions to improve confidence around its use. Additionally we are designing a standardised discharge protocol, that may help to minimise inappropriate transfers to the ward and identify any issues earlier in a patient's recovery. These are both alongside further training for our clinical staff.

Conclusion: Our study aimed to reduce unplanned admissions following day-case surgery by introducing Prilocaine as an intrathecal agent. While we observed a modest reduction in unplanned admissions, further fine-tuning is necessary. To achieve this, we are implementing several strategies to enhance the use of Prilocaine and improve patient outcomes. A subsequent audit will assess the impact of these interventions.

41AP02-10

The use of neuromuscular blocking agents and its reversal in adult, pediatric and pregnant patients in Italy: a survey of current management

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Background and Goal of Study: Despite the existence of national and international guidelines in management of myoresolution, there is a persistent heterogeneity in the use of neuromuscular blocking agents by Italian anesthesiologists. The aim of this article is to show the results of an Italian survey conducted to obtain information on the current management of myoresolution in Italy. Materials and Methods: A digital questionnaire was created and spread in different ways (as link via social networks or by word of mouth) to obtain data among specialists and residents in Anesthesia during a period between February 2023 and February 2024. The questions were about the type of patient, neuromuscular blocking agents used, frequency of use and type of neuromuscular monitoring, TOF ratio value considered safe to assess recovery from myoresolution, use of reversals with side effects related, incidence of postoperative residual curarization (PORC). All the information obtained has been stratified by age, geographical location and type of workplace (public or private centre). Moreover, data were collected anonymously and were analyzed considering the values in percentages.

Results and Discussion: The questionnaire was completed by 287 anesthesiologists. Rocuronium is the most widely used neuromuscular blocking agent in adult, pediatric and pregnant patients. Neuromuscular monitoring is used most frequently in relation to the type of patient (ASA \geq 2) and the type of procedure (major surgery) in both adults and children. In pregnant women, anesthesiologists who never use it predominate. Sugammadex is the most widely used reversal in both adults, pregnant women and children. Neuromuscular monitoring systems are little used while the clinical manifestations would seem to guide the possible additional doses of neuromuscular blocking agents or to evaluate recovery from neuromuscular blockade. This is one of the aspects that can explain why the incidence of PORC is not so low. Conclusions: This survey highlight what is the current Italian experience regarding the myoresolution in pediatric and adult patients. The data obtained show that clinical practice in the management of correct myoresolution is still not standardized. The immediate consequence is the real risk of incomplete neuromuscular recovery. A routine use of neuromuscular monitoring systems should be pursued to manage both neuromuscular blocking agents and their reversals in a more rational and conscious way.

41AP02-11

Comparison of Remimazolam PK/PD models in maintaining moderate sedation during knee and hip arthroplasty: a randomized study

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Background and Goal of Study: Various PK/PD models based on different populations are available for Remimazolam precision dosing using infusion. This study compared three published models (Schmith, Schüttler, Masui) in achieving moderate sedation (MOAA/S 2-3) during knee or hip arthroplasty under spinal anesthesia. Primary endpoints were time in target sedation range, target adjustments, remimazolam consumption (ml/kg/h), and mean target effect-site concentration (Ce) for achieving target sedation, EC50. Secondary endpoints were correlation between calculated Ce and MOAA/S and Patient State Index (PSI).

Materials and Methods: Twenty-four patients meeting criteria were included (Figure 1). Remimazolam was administered using target-controlled infusion, guided by one of three models. Initial target Ce was set at 0.2-0.4 µg/mL over 10 minutes (0.2 mg/mL concentration). MOAA/S, PSI, and physiological parameters were evaluated every 5 minutes, with target Ce adjusted accordingly in steps of ≥0.05 µg/mL for moderate sedation.

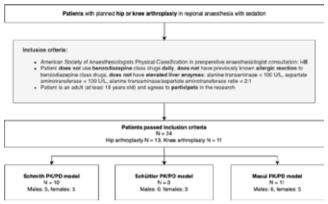


Figure 1. Study design.

Results and Discussion: Schmith model ensured the most time in target range (61%[45-77%]), followed by Schüttler (65%[33-97%]) and Masui (59%[41-78%]). Schüttler model required the fewest target adjustments (4[2-6]), while Masui and Schmith required 5[3-6]. Consumption was lowest with Masui model (0.209 mg/kg/h[0.163-0.294]). All differences were insignificant (p>0.05). Average Ce during sedation depth of MOAA/S 2-3 significantly differed between models (p<0.05): Schmith 0.186 mg/ mL[0.177-0.195], Schüttler 0.226 mg/mL[0.208-0.243], Masui 0.199 mg/mL[0.191-0.207]. Determined EC50 values: Schmith = 0.131[0.045-0.170], Schüttler = 0.175[0.021-0.228], and Masui = 0.116. Negative correlations were found between Ce and MOAA/S: Schmith (r=-0.329,p<0.05), Schüttler (r=-0.354,p<0.05), and Masui (r=-0.364,p<0.05). The correlation between Ce and PSI was moderate in Schüttler (r=-0.403,p<0.05), weak in Masui (r=-0.247,p<0.05).

Conclusions: Remimazolam PK/PD models demonstrated similar performance in maintaining sedation, each with specific strengths. PK/PD model calculated Ce correlated with clinical and measured sedation depth.

41AP02-12

Apnea during moderate to deep sedation using continuous infusion of remimazolam compared to propofol and dexmedetomidine

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Background and Goal of Study: Remimazolam's rapid onset and offset make it an innovative sedative for use during regional anesthesia. However, its respiratory safety profile is not well understood. We compared the continuous infusion of remimazolam with commonly used sedatives, propofol and dexmedetomidine, after regional anesthesia.

Materials and Methods: This retrospective study included patients aged over 17, American Society of Anesthesiology (ASA) physical status 1 to 3, who underwent orthopedic surgery under regional anesthesia (neuraxial or brachial plexus blockade) and sedation with continuous infusion of dexmedetomidine, propofol, or remimazolam from February to December 2021.

Patients were designated as group R (remimazolam), P (propofol). or D (dexmedetomidine) according to the primary sedative used. Group R: remimazolam: 3 mg/kg/hr over 2 minutes followed by 0.5 mg/kg/hr continuous infusion

Group P: propofol: administered using target-controlled infusion (Schnider model), starting with 2-3 µg/mL

Group D: dexmedetomidine: 1 µg/kg infused over 10 minutes followed by 0.4-1 µg/kg/hr continuous infusion

Supplementary oxygen was routinely administered via a simple facial mask at a rate of equal to or above 5 L/min with side port expired CO₂ monitoring before the beginning of the sedation.

Apnea event was defined as expired CO₂<1 mmHg over consecu-

Several parameters related to apnea event including incidence (per group), total apnea time, number of event (per case), apnea index (apnea event per hour), and time of the first apnea event (onset time) were assessed.

Additionally, desaturation defined as SpO₂<94% over consecutive 30 seconds was assessed.

Results and Discussion: The apnea and desaturation events were summarized in Table. The incidence of apnea over 10 seconds was 63.9%, 67.3%, and 48.5% in group R, P, and D, respectively (overall, p<0.001). The incidence of desaturation over 30 seconds was 19.9%, 20.9%, and 10.9% in group R, P, and D, respectively (overall, p=0.022).

Several statistical measures were implemented to minimize potential biases in this study, but some limitations remain. The intervention threshold for apneic events was not predetermined, varying with the attending physician, potentially biasing outcomes such as total apnea time, apnea events per case, and desaturation events.

However, bias in the overall apnea incidence should be minimal, as no preventive measures were selectively applied in advance. The level of sedation was unreported, possibly causing an imbalance in sedation depth between groups. Despite this, sedations adhered to institutional protocol, suggesting significant variations, especially at initiation, were unlikely, and the protocol aimed for at least moderate sedation.

	Remimazolam	Propofol	Dexmedeto-				
	(R)	(P)	midine (D)	Overall P	D vs P	D vs R	R vs P
	(n=191)	(n=278)	(n=165)		p*	p*	p*
Apnea incidence (incidence per group)							
0	69 (36.1)	91 (32.7)	85 (51.5)	<0.001	<0.001	< 0.007	<0.508
1-2	51 (26.7)	82 (29.5)	42 (25.5)	NA	NA	NA	NA
>2	71 (37.2)	105 (37.8)	38 (23.0)	NA	NA	NA	NA
Total apnea time (seconds)	39.0 (0.0, 115.5)	40.5 (0.0, 185.0)	0.0 (0.0, 61.0)	<0.001	<0.001	<0.104	<0.018
Apnea event (per case)	1.0 (0.0, 4.0)	2.0 (0.0, 5.0)	0.0 (0.0, 2.0)	<0.001	0.011	0.194	0.173
Apnea index (event per hr)	1.0 (0.0, 3.3)	1.5 (0.0, 5.0)	0.0 (0.0, 1.7)	<0.001	<0.001	0.247	0.004
Apnea onset (min)	8.9 (4.6, 15.7)	9.5 (5.1, 18.8)	18.6 (10.5, 29.1)	<0.001	0.001	0.001	0.774
Desaturation event (incidence)	38 (19.9)	58 (20.9)	18 (10.9)	0.022	0.032	0.044	0.890

Conclusion: The findings of the current study demonstrated a considerable incidence of apneic events during moderate to deep sedation with remimazolam infusion. Although these events did not result in severe adverse events, it is important not to underestimate the risk of apnea, and close monitoring is strongly advised.

41AP03-1 Successful use of terlipressin to treat refractory shock after adrenal vein ligation in pheochromocytoma surgery

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Background: Severe hypotension after adrenal vein ligation in pheochromocytoma surgery can be extremely severe and catecholamine-resistant [1]. Underlying mechanisms are sudden catecholamine deficiency in combination with a down-regulation of catecholamine receptors caused by chronic elevation of catecholamines. Chronic elevation of catecholamines may also suppress vasopressin synthesis.

Case Report: A 36-year-old female patient with a medical history of a 14x10 cm right adrenal paraganglioma (pheochromocytoma) metastatic to liver and secreting metanephrine (>100x normal levels) and normetanephrine (>40x normal levels) underwent open surgery after 2 weeks of pharmacological preparation with prazosin. Intraoperative tachycardia events were treated with landiolol and hypertensive events (systolic blood pressure >180 mmHg) with a continuous infusion of urapidil. Adrenal vein ligation was anticipated by stopping urapidil and maintaining adequate systolic blood pressure (>140 mmHg). After ligation, a severe drop in blood pressure was noted with a systolic blood pressure of approximately 40 mmHg for 10 minutes despite a high dose of noradrenaline exogenous infusion (up to 2 mg/hr) and fluid load. Terlipressin 0.5 mg was administered and resulted in a rapid correction of blood pressure and a decrease of noradrenaline support up (to 0.1 mg/hr) in just a few minutes.

Discussion: Terlipressin is a long-acting vasopressin analog with a partial selectivity for vasopressin V1a receptor. Several case reports described vasopressin use in a refractory shock after pheochromocytoma resection, but this is the first case report describing terlipressin use in this setting. Terlipressin is used with multiple-dose regimens in refractory septic shock [2] with a usual dose of 1 mg each 4 to 6 hours but this high dose can be associated with side effects and complications, such as mesenteric and digital ischemia. A low dose of terlipressin (bolus 0.5 mg or low continuous dose 1-2 mcg/kg/hr) can be sufficient to reverse hypotension and minimize side effects.

References:

- 1. Perioperative care of pheochromocytoma. Connor D et al. BJA Education (2016)
- 2. Terlipressin for septic shock patients: a meta-analysis of randomized controlled study. Zhu Y et al. J Intensive Care (2019) Learning Points: Terlipressin can be used in severe hypotension refractory to catecholamines after pheochromocytoma resection. Low-dose terlipressin is to be used to minimize potential side effects.

41AP03-2

Opioid resistance in a patient with prolonged cessation of oral naltrexone use: a case report

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Background: The suspension of medications like Naltrexone is critical in anesthesiology. The case presented here illustrates a situation that deviates from established protocols1 and in which the interpretation is similar to other published reports².

Case Report: A 37-year-old woman underwent total thyroidectomy with general anesthesia and electrophysiological monitoring. Her history included chronic headaches treated with simple analgesics and recent use of Naltrexone for weight loss, discontinued 30 days pre-surgery. Upon admission, She presented with anxiety, managed with Midazolam, and received Sufentanil, Lidocaine, Propofol, Succinylcholine, and Ketamine for induction. During the surgery, the patient experienced increased heart rate, blood pressure, tremors, and a rise in Bispectral Index values, which required analgesic rescue. This pattern repeated, necessitating high doses of opioids (Sufentanil 0.7 mcg/kg, Remifentanil 1.5 mg) and adjuvants (Ketamine 0.55 mg/kg, Clonidine 1 mg/kg, Lidocaine 1.38 mg/kg). At the end of the procedure, extubation occurred without complications, 15 minutes after discontinuing Propofol.

Postoperatively, she experienced severe pain (7/10), treated with morphine, ketorolac, and dipyrone, yielding partial relief. Later, she disclosed prior use of high-dose Naltrexone (64 mg/day) and Bupropion (720 mg/day) for five months before stopping.

Discussion: The findings suggest prolonged Naltrexone effects, including opioid resistance persisting after its cessation. This resistance may result from extended use and high dosing, highlighting the need for revised perioperative management protocols in patients discontinuing Naltrexone.

References:

1. Goel, Akash, Bhavya Kapoor, Mia Wu, Mudia Iyayi, Marina Englesakis, Lynn Kohan, Karim S Ladha, and Hance A Clarke. 2024. "Perioperative Naltrexone Management: A Scoping Review by the Perioperative Pain and Addiction Interdisciplinary Network." Anesthesiology 141 (2): 388–99. https://doi. org/10.1097/aln.0000000000005040.

2. Tesson, B, A Bigot-Viale, J P Vigue, M Pierrot, and J C Granry. 1999. "Interactions between Naltrexone, an Opioid Antagonist, and Opioids Administered during General Anesthesia." Annales Françaises d'Anesthesie et de Reanimation 18 (2): 230-32. https://pubmed.ncbi.nlm.nih.gov/10207596/.

Learning Points: This case highlights the importance of suspending Naltrexone in perioperative management and the need for more evidence, particularly regarding its prolonged use.

41AP03-3 When ondansetron hits different: a rare extrapyramidal reaction

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Background: Ondansetron, a 5-HT3 receptor antagonist, is widely used for managing nausea and vomiting in perioperative settings and chemotherapy. Common neurological side effects include fatigue, headache, and malaise. Extrapyramidal reactions are rare and mostly associated with metoclopramide. Reports of ondansetron-induced reactions are limited to a few outdated

Case Report: A 77-year-old male with stage IV small cell lung cancer (no cerebral metastases) experienced altered mental status and facial paresis minutes after ondansetron administration, initially suspected to be an acute vascular event. Angio-CT was normal, and symptoms resolved within 1.5 hours.

Days later, similar symptoms recurred, again linked to ondansetron. Severe hyponatremia complicated the case, but symptoms resolved minutes after biperiden administration, implicating ondansetron despite other confounding factors. Recognizing this rare adverse reaction required thorough evaluation and exclusion of life-threatening conditions.

Discussion: Nausea and vomiting are common in oncology, with ondansetron frequently used due to its safety and efficacy. Extrapyramidal reactions to ondansetron are rarely reported, but they can range from mild impairment of movements to altered mental status states, with airway compromise, sustaining a threat to life.(1)(2)

This case presented with altered mental status and facial paresis, mimicking vascular or cardiac events. Severe hyponatremia was initially considered as the cause, but detailed analysis of drug timing implicated ondansetron. Biperiden, an anticholinergic used for extrapyramidal symptoms, effectively reversed the reaction. Accurate drug history and high clinical suspicion were critical to diagnosis. Oncologic patients are often fragile, with multiple comorbidities and aggressive treatments. Every administered drug must be carefully assessed to minimize risks.

References:

- 1. Ritter MJ, Goodman BP, Sprung J, Wijdicks EFM. Ondansetron-induced multifocal encephalopathy. Mayo Clin Proc. 2003;78(9):1150-2.
- 2. Kumar N, Hu WTL. Extrapyramidal reaction to ondansetron and propofol. Mov Disord. 2009;24(2):312-3.

Learning Points: Ondansetron adverse reactions can mimic lifethreatening conditions; prompt and accurate investigations are essential.

In complex cases, a detailed drug history and high index of suspicion aid diagnosis.

Awareness of this rare reaction can avoid unnecessary diagnostics and inappropriate treatments.

41AP03-4

Optimizing sedation in endoscopic retrograde cholangiopancreatography: validation of a pharmacodynamic response surface model

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Background and Goal of Study: Endoscopic Retrograde Cholangiopancreatography (ERCP) requires precise sedation to ensure patient comfort and safety while maintaining rapid recovery. Advances in anesthetic monitoring, particularly the use of raw EEG, have improved our understanding of anesthesia depth. The interaction of anesthetic agents, however, remains challenging due to inter- and intraindividual variability. An existing NLMAZ response surface model has been validated for predicting patient responses to sedation with a triple-drug combination of midazolam, alfentanil, and propofol during endoscopic procedures. This study aimed to validate the Non-Linear Mixed Amount with Zero Amount (NLMAZ) response surface model for predicting sedation depth in patients undergoing Endoscopic Retrograde Cholangiopancreatography (ERCP), to explore the pharmacodynamics of multidrug anesthesia regimens.

Materials and Methods: Patients undergoing ERCP in Taipei Veterans General Hospital during January 2023 to March, 2024 under intravenous sedation were included. Sedation depth was assessed using the Modified Observer's Assessment of Alertness/ Sedation (MOAA/S) score and effect-site concentrations calculated from pharmacokinetic models. Custom MATLAB scripts analyzed EEG data for frequency power changes to correlate sedation depth with drug combinations.

Results and Discussion: Patient recruitment faced challenges and seven patients undergoing ERCP were included. The NLMAZ model achieved a prediction accuracy of 70% for MOAA/S <2, consistent with previous validation studies (76%-83%). EEG power analysis demonstrated characteristic changes during sedation, including increased alpha and delta activity. Positional effects, such as reduced alpha power in prone positioning, were noted, likely due to altered cerebral perfusion or CSF distribution.

The NLMAZ model effectively predicted anesthetic depth with acceptable accuracy in ERCP, demonstrating its applicability to clinical sedation management. However, individual variability and procedural factors such as positioning influenced the model's predictive accuracy.

Conclusion(s): The NLMAZ model is a valuable tool for optimizing sedation in ERCP. While effective, further studies with larger datasets are needed to refine predictions and explore the impact of positional and physiological factors on sedation depth.

41AP03-5 HX20304: a novel non-opioid compound with potent analgesic effects

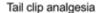
X. Xie1, C. Deng1, S. Liu1, P. Gao1, W. Zhang1 ¹West China Hospital of Sichuan University, Department of Anesthesiology, Chengdu, China

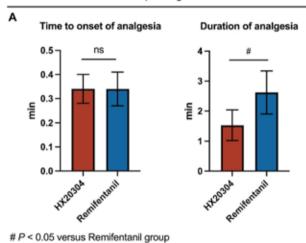
Background and Goal of Study: It is necessary to develop new powerful analgesics because of the global opioid crisis. The purpose of this study is to determine the potent analgesic effects of a novel non-opioid compound.

Materials and Methods: We obtained the non-opioid compound HX20304 based on previous studies. With remifentanil as the positive control, the tail clip test using an alligator clip was applied to determine the strong analgesic effect of HX20304, and plantar incision and spared nerve injury (SNI) models were used to demonstrate the effects of HX20304 in other pain.

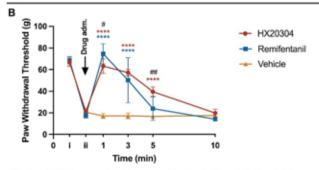
Using naloxone antagonism test to explore the relationship between HX20304 and opioid receptors. Mann-Whitney U test and two-way ANOVA analysis were applied with P<0.05 for signifi-

Results and Discussion: HX20304 exhibited strong analgesic effects in tail clip test, plantar incision, and SNI models, comparable to remifentanil. Using naloxone did not antagonize the analgesic effect. Based on these, we obtained a novel compound exhibiting potent analgesic effects without acting on opioid receptors.



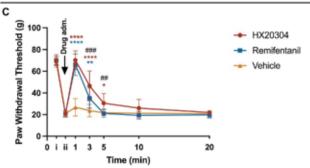


Analgesia in plantar incision 1 hour



**** P < 0.0001 versus Vehicle group; ## P < 0.01, and # P < 0.05 versus Remifentanil group; i, baseline; ii, modeling

Analgesia in SNI-induced neuropathic pain 14 days



**** P < 0.0001, ** P < 0.01, and * P < 0.05 versus Vehicle group; ### P < 0.001, and ## P < 0.01 versus Remifentanil group; i, baseline; ii, modeling

Antagonism of the analgesic effect by naloxone				
Drug/Compound	Antagonistic rate (%)			
Remifentanil	100			
HX20304	0			

Conclusion(s): HX20304 is a novel analgesic compound with the following characteristics: (1) non-opioid structure; (2) strong analgesic effects comparable to opioids; (3) no acting on opioid receptors. Further research will be done on the analgesic target and mechanism of HX20304.

41AP03-6

A rare cases of methaemoglobinaemia in cancer patients: clinical cases

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Background: Methemoglobinemia is a serious disorder characterized by impaired oxygen binding to iron in hemoglobin, followed by impaired oxygen delivery to body tissues. Various benzocainecontaining drugs can cause acquired methemoglobinemia. It is important for healthcare professionals to be aware of the signs and symptoms of methemoglobinemia and have a high index of suspicion for patients with unexplained cyanosis or impaired oxygen delivery.

Case report: The presented clinical cases describe methemoglobinemia associated with the use of the antacid Almagel A (magnesium hydroxide + benzocaine) in a 32-year-old woman with laryngopharyngeal cancer and a 45-year-old woman diagnosed with left kidney cancer, who were hospitalized at the Kazakh Research Institute of Oncology and Radiology.

Patients were transferred to the intensive care unit with symptoms of respiratory failure, such as cyanosis, fatigue, headaches, tachypnea and decreased saturation (SPO2) to 74-78% by pulse oximetry. Instrumental and laboratory study parameters were normal.

Arterial blood gas analysis showed an increase in the methemoglobin fraction (FMetHb) - 24-49% and a decrease in the oxyhemoglobin fraction (FO2Hb) 74-47%.

Patients were prescribed antidote therapy - methylene blue 1% at a rate of 1 mg / kg in the form of infusion. Arterial blood gas analysis (FMetHb, FO2Hb), saturation and skin color were monitored.

As a result, against the background of methylene blue infusion, patients showed clinical improvement with the disappearance of cyanosis, normalization of the FMetHb and FO2Hb in arterial blood.

Discussion: The presented clinical cases indicate that the use of over-the-counter drug magnesium hydroxide + benzocaine in patients can lead to serious adverse effects, such as methemoglobinemia and may cause life-threatening conditions, especially in patients with severe diseases.

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Learning points: These clinical cases demonstrate the difficulties of diagnosing methaemoglobinaemia and the effectiveness of using methylene blue as an antidote drug in treatment.

41AP03-7

Enhanced propofol toxicity via energy metabolism shift by circumventing the Crabtree effect: analysis of myoblasts and myotubes

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Background and Goal of Study: Propofol infusion syndrome (PRIS) predominantly affects pediatric patients and is associated with mitochondrial dysfunction; however, its underlying mechanisms remain unclear. In perioperative sedation, factors such as insulin resistance, fasting, reduced physical activity, and catecholamine release can limit glycolysis, shifting energy production to oxidative phosphorylation (OXPHOS). Skeletal muscle cells typically rely on glycolysis under glucose-rich conditions (Crabtree effect), but culturing cells in galactose medium suppresses glycolysis and forces reliance on OXPHOS as the primary energy source.

This study evaluated how such metabolic shifts affect propofol toxicity in skeletal muscle cells.

Materials and Methods: L6 myoblasts and myotubes were cultured in glucose and galactose medium to circumvent the Crabtree effect, shifting metabolism from glycolysis to OXPHOS. Propofol toxicity was assessed by measuring cell viability, lactate dehydrogenase (LDH) release, ATP production, and wound healing via scratch assay (n=3). Dexmedetomidine was tested under similar conditions to compare effects on cell viability and wound healing. Statistical analysis used ANOVA, with p<0.05 considered significant.

Results and Discussion: In galactose medium, propofol exposure significantly reduced cell viability (87.94% ± 2.55, p<0.05) at lower concentrations than in glucose medium, with increased LDH release, reduced ATP production, and impaired wound healing $(23.02 \pm 0.12\% \text{ to } 10.45 \pm 0.86\%, p<0.001)$. These effects were more pronounced in myoblasts compared to myotubes. In contrast, dexmedetomidine maintained cell viability and promoted wound healing regardless of the metabolic state. Skeletal muscle, which accounts for approximately 70% of systemic glucose utilization, is thought to be highly sensitive to metabolic disruptions, suggesting a potential role in the pathophysiology of PRIS. Particularly in pediatric patients with active muscle development, skeletal muscle metabolism may contribute significantly to PRIS susceptibility.

Conclusion(s): Propofol showed greater toxicity in myoblasts than in myotubes, with toxicity significantly enhanced under OX-PHOS-dependent conditions. These results highlight the importance of further investigation into skeletal muscle metabolism and its role in the pathophysiology of PRIS, particularly in pediatric populations.

41AP03-9

Anesthetic management of pheochromocytoma surgery. Case series

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Background: Pheochromocytoma is a catecholamine-producing tumour that can be treated with laparoscopic adrenalectomy. There is a risk of hypertensive crises due to the release of catecholamines. Patients typically present with arterial hypotension following resection due to relative vasodilatation and the residual effect of antihypertensive drugs.

Case report: Patient 1(P1): 36-year-old male with neurofibromatosis, diagnosed due to metanephrines determination. Premedication (PM): nifedipine.

P2: 55-year-old female with hypertension.

PM: doxazosin, nifedipine, propranolol. P3: 73-year-old male with palpitations and tremors.

PM: nifedipine. P4: 60-year-old female with a history of essential hypertension and hyperhidrosis. PM: doxazosin and propranolol. P5: 39-year-old male with a weight loss and hypertension.

PM: doxazosin, atenolol, nifedipine. P6: 56-year-old female with chest discomfort and hypertension.

PM: doxazosin, nifedipine, bisoprolol. P7: 58-year-old female with headache and hypertension.

PM: nifedipine, propranolol. Upon entering the operating room, it was observed that each patient exhibited hemodynamic stability. An epidural catheter was placed for post-operative analgesia, and general anaesthesia was performed.

The hemodynamic parameters were monitored by the Vigileo-FloTrac system, while nociception was assessed by nociceptor index (NOL) levels in patients 6 and 7. The NOL proved an effective method of distinguishing between haemodynamic changes resulting from catecholamine release or nociceptive stimulation. All patients received clevidipine infusion at the outset of the surgical procedure, which proved effective in reducing hypertensive peaks within minutes.

Following tumour excision, clevidipine was discontinued in all patients. Arterial hypotension occurred in all patients but was rapidly resolved with fluid therapy comprising objective infusion rates and intermittent boluses of phenylephrine. No patients required vasopressor infusion.

Discussion: Clevidipine is an intravenous calcium antagonist with rapid onset and a short half-life, which could be an optimal antihypertensive agent in the treatment of pheocromocytoma¹

References:

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Learning points: It is essential to control haemodynamic parameters in pheochromocytoma surgery, with the use of fast and reversible drugs, with monitoring to ensure proper administration

Conclusion(s): Cefazolin 2g before incision and 1g after 2 hours provided optimal coverage for the initial surgery phase. However, additional doses, depending on surgery duration and patient characteristics (e.g., eGFR), are crucial to maintain adequate concentrations until closure. Increasing the sample size could provide more significant data.

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- 2. Zelenitsky et al. (2018) doi:10.1128/AAC.01360-18

41AP03-11

Pharmacokinetics and pharmacodynamics of cefazolin: clinical implications for antibiotic prophylaxis in urologic and thoracic surgery preliminary results

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Background and Goal of Study: Surgical site infections (SSIs) are frequent healthcare-associated infections, causing significant morbidity, mortality, and costs. Antibiotic prophylaxis (AP), particularly with cefazolin, is vital for prevention. However, doubts persist about timing of administration, dosage, and redosing

This study aimed to: evaluate AP through a pharmacokinetic/ pharmacodynamic (PK/PD) approach, measuring cefazolin plasma concentrations and comparing them with minimum inhibitory concentration (MIC) values of pathogens responsible for SSI and with literature cut-offs associated with a higher infection risk; correlate drug levels to clinical variables and SSI occurrence.

Materials and Methods: A single-center prospective observational study has been conducted at a University Hospital in Italy since October 2023, involving urological and non-cardiac thoracic surgeries. Cefazolin was administered as per best clinical practice (2g within 1 hour before incision and 1g redosing after 2 hours).

Blood samples were collected at specific time points and concentrations measured using UHPLC-MS/MS. Clinical and outcome data on SSI were collected. Univariate analyses were performed using T-tests (after Shapiro-Wilk normality checks) and Chisquare or Fisher's exact tests.

Results and Discussion: Twenty-nine patients were included (59% thoracic, 41% urological), with a mean (SD): age 67.8 (8.0) years, body mass index (BMI) 24.8 (4.0) kg/m², eGFR 66.6 (28.0) ml/min. No superficial SSIs were found, but 3 cases of organ/ space SSIs occurred. The average total cefazolin plasma concentration at closure (T4) was 98.23 mg/L (19.65 mg/L free fraction). Free T4 was below 4 mg/L (EUCAST MIC for S. aureus1) in only one case, but below 16 mg/L in 10 cases. Total T4 was below 104 mg/L (best available literature option²) in 18 cases.

An interval between redosing administration and surgery completion exceeding 2 hours and eGFR >50 ml/min correlated with significantly lower T4, unlike BMI ≥25 kg/m².

41AP03-12

Ex Vivo optimization of donor lungs with inhaled sevoflurane during normothermic ex vivo lung perfusion (VITALISE)

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Background: Volatile anesthetics interfere with many processes underlying IRI and exerts lung protective properties. Multiple points of engagement are involved, including prevention of opening of mitochondrial permeability transition pores, preservation of glycocalyx, and direct effects on circulating immune. Ex vivo lung perfusion (EVLP) facilitates evaluation of grafts and extension of preservation time, and provides a therapeutic window of oppor-

We hypothesize that ventilation of donor lungs with sevoflurane during EVLP reduces injury and improves the quality of the transplanted lungs.

Methods: Thirty two lungs were randomized to 4 groups (n=8/ group) ventilated with sevoflurane 0%,2%,4%,6% Cet during EVLP in a slaughterhouse sheep model. Lungs were, flushed, and preserved cold storage for 3h, after which 4h EVLP was initi-

When a temperature of 32°c was reached ventilation was started. Functional measurements were recorded. Perfusate and tissue samples were collected.

Results: A steady state of the different target Cet sevoflurane was reached after 10 minutes (Figure 1).

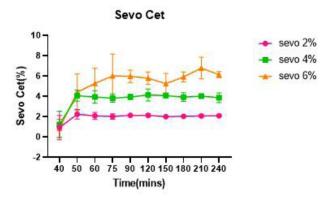


Figure 1.

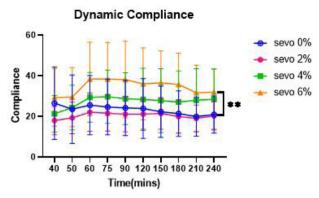


Figure 2.

The Sevo-6% group showed increase dynamic compliance (p=0.006) compared to Sevo-0% group (Figure 2).

After correcting the data to eliminate the effects of individual differences, Sevo-2%,4%,6% groups showed better compliance over time (p<0.0001). Sevo-6% group showed better oxygenation ability compared to Sevo-0% group (p=0.049).

Wet weight/dry weight ratio and post-pre EVLP lung weight indicated no differences between groups. Sevo-4% group showed highest potassium levels in the perfusate (0% vs 4%: 4.33 vs 4.52,p=0.008) and Sevo-2% group showed lowest lactate levels in the perfusate (0% vs 2%: 0.93 vs 0.89,p=0.003).

Conclusion(s): Ventilating lungs with sevoflurane during EVLP showed better compliance and oxygenation ability, especially the Sevo-6% group, while no differences on edema.

41AP04-1

Acute restraint stress, not laparotomy, induces an increase in blood-brain barrier permeability in young mice

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Background and Goal of Study: Postoperative delirium (POD) develops as a direct result of surgical stress, preexisting vulnerability factors, such as advanced age, and additional factors, such as psychological stress. One potential mechanism underlying POD is blood-brain barrier (BBB) dysfunction as animal models exhibit such dysfunction. Here, we investigated the effects of acute restraint stress and laparotomy on BBB permeability in young mice. Materials and Methods: All experiments were performed according to the institutional guidelines and approved by the Animal Care Committee of Nagoya University. Male C57BL/6NJ mice, 10-11 weeks of age, were divided randomly into three groups (n = 9-12/group): control, restraint stress, and abdominal surgery under isoflurane anesthesia (iso/surgery). Fluorescein sodium salt (NaFl, 200 mg/kg), a tracer of BBB permeability, was administered subcutaneously, followed by restraint stress or iso/surgery 15 min later. Restraint stress utilized ventilated cylinder tubes that were placed vertically with the mouse head upward.

Stressed mice were left for 30 min and then returned to their home cages. Anesthesia was induced in the iso/surgery group in an anesthesia box for 5 min and then maintained at 1.5%-1.7% isoflurane using masks for 25 min, during which laparotomy was performed.

After shaving and cleaning the abdominal region, a 2.0-cm midline incision was made, the small intestine was manipulated for 1 min, and the incision was sutured. Thirty minutes after restraint stress or iso/surgery, the mice were euthanized and immediately perfused with saline. The frontal cortex was collected, weighed, homogenized in 20% trichloroacetic acid, and kept on ice for 30 min. Samples were centrifuged at 18,000×g at 4 °C for 15 min, and the fluorescence of the supernatant was measured using a fluorometer. NaFI contents in the frontal cortex were calculated as µg/g tissue wet weight. Differences between groups were evaluated using a two-tailed t-test. Differences were considered statistically significant at p < 0.05.

Results and Discussion: Although acute restraint stress caused a significant increase in the NaFI concentration in the frontal cortex, no changes were observed in the iso/surgery group. This suggests that psychological stress may play a greater role in the development of POD than surgical stress.

Conclusion(s): We demonstrated that acute restraint stress, but not laparotomy, increased BBB permeability in young mice.

Randomized controlled trial comparing the impact of deep versus moderate/superficial NMB on surgical conditions and muscle trauma during hip arthroplasty by direct anterior approach using minimally invasive surgery under opioid free anesthesia

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Background & goal of the study: The anterior approach for hip arthroplasty requires sufficient muscle relaxation to minimize trauma and ensure optimal surgical access. Inadequate relaxation can lead to muscle tears and contusions, increasing postoperative pain and inflammation.

This study evaluates whether clinical deep neuromuscular block (NMB) provides better surgical conditions than moderate NMB during hip arthroplasty.

Methods: This randomized controlled trial with blinded surgeons included 80 patients undergoing anterior approach hip arthroplasty. Patients were randomized into clinical deep NMB (posttetanic count < 6) or moderate/superficial NMB. Neuromuscular transmission monitoring verified block depth. All patients received opioid-free anesthesia using low-dose dexmedetomidine. lidocaine, and ketamine. Analgesia Nociception Index (ANI) monitoring was used to guide drugs administration to maintain low sympathetic stress.

Postoperative analgesia included paracetamol, NSAIDs, and rescue opioids. Surgical exposure, assessed using the adapted Leiden 5-point scale, postoperative pain, and muscle integrity were evaluated. CK and CRP levels were measured 24 hours postoperatively.

Results & Discussion: Deep NMB significantly improved exposure during incision (p=0.001), prosthesis insertion (p=0.008), and closure (p=0.001). No differences were observed in postoperative opioid consumption (p=0.66) or pain scores. CRP levels, nearly normal (20.18 & 18.54) and much lower than the 60 mg/ ml typically seen after opioid anesthesia with high-dose steroids (1), indicated minimal inflammatory reactions. This was attributed to the anti-inflammatory effects of the opioid-free protocol guided by ANI monitoring. Muscle tears and contusions were more frequent in the moderate NMB group (p=0.001) confirmed by a higher CK (476 vs. 298; p=0.016). No difference was found in postoperative Qo15 questionnaire results.

Conclusion: Deep NMB enhances surgical exposure and reduces intraoperative muscle damage without increasing postoperative pain or inflammatory markers. These findings support its use in anterior hip arthroplasty to minimize trauma and improve outcomes. The opioid-free anesthesia protocol effectively controlled inflammation, further optimizing perioperative care.

References:

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41AP04-3

Lidocaine pre-treatment suppresses the acute restraint stress-induced increase in blood-brain barrier permeability in mice

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Background and Goal of Study: Several lines of evidence suggest that psychological stress can lead to increased blood-brain barrier (BBB) permeability. Additionally, vascular endothelial growth factor (VEGF) is a vascular permeability factor that promotes angiogenesis and increases BBB permeability. We have previously demonstrated in vitro that lidocaine suppresses VEGFinduced angiogenesis by inhibiting VEGF receptor-2 phosphorylation. Here, we investigated the effect of lidocaine pre-treatment on acute restraint stress-induced increases in BBB permeability in mice.

Materials and Methods: All experiments were performed according to the institutional guidelines and approved by the Animal Care Committee of Nagoya University. Male C57BL/6NJ mice, 10-11 weeks of age, were divided randomly into four groups (n=11-12/group): subcutaneous (s.c.) saline-administered control, saline s.c. + restraint stress, lidocaine 25 mg/kg s.c. + restraint stress, and lidocaine 50 mg/kg s.c. + restraint stress. Fluorescein sodium salt (NaFI; 200 mg/kg s.c.), a tracer of BBB permeability, was administered simultaneously with saline or lidocaine, followed by restraint stress 15 min later. Restraint stress utilized ventilated cylinder tubes that were placed vertically with the mouse head upward. Stressed mice were left for 30 min and then returned to their home cages. Thirty minutes after stress, the mice were euthanized and immediately perfused with saline. The frontal cortex was collected, weighed, homogenized in 20% trichloroacetic acid, and kept on ice for 30 min. Samples were centrifuged at 18,000×g at 4 °C for 15 min, and the fluorescence of the supernatant was measured using a fluorometer. NaFl contents in the frontal cortex was calculated as µg/g of tissue wet weight. Differences between the groups were evaluated using a two-tailed t-test or one-way ANOVA followed by Dunnett's test. Differences were considered statistically significant at p < 0.05.

Results and Discussion: Acute restraint stress increased NaFl concentration in mice's frontal cortex by approximately 15%. Both lidocaine doses showed a control level for NaFl concentration.

These results suggest that lidocaine pre-treatment can suppress the psychological stress-induced BBB permeability increase in mice.

Conclusion(s): We demonstrated that acute restraint stress increased BBB permeability in mice, which was suppressed by systemic lidocaine pre-treatment.

41AP04-5

The impact of local anesthetics on wound closure in cultured A549 human epithelial lung cells

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Background and Goal of Study: Wound healing is a critical physiological process involving hemostasis, inflammation, proliferation, and tissue remodelling. Surgical wounds, though necessary for therapeutic interventions, are prone to complications, which impose significant healthcare burdens. Local anesthetics, commonly used during surgery for pain control, may affect wound healing.

This study investigates the effect of lidocaine and bupivacaine on wound closure in vitro using A549 human epithelial lung cells.

Materials and Methods: A549 cells were cultured to confluence and subjected to scratch assays to simulate wounds. Cells were exposed to lidocaine (2,4 and 8 μ g/mL) or bupivacaine (1,2 and 4 μ g/mL) under two conditions: 24-hour continuous exposure and 1-hour exposure followed by fresh medium replacement. Wound closure was monitored via microscopy over 24 hours, and cell-free areas were quantified using FIJI software. Statistical analyses were performed to compare wound closure rates among different groups, with significance set at p < 0.05.

Results and Discussion: Continuous exposure to both lidocaine and bupivacaine resulted in significant inhibition of wound closure, with larger wound areas after 24 hours compared to controls. Short-term lidocaine exposure (1 hour) showed no significant effect on wound closure, while bupivacaine exhibited a concentration-dependent delay in wound healing. Short term bupivacaine exposure at 4 μ g/mL caused an increase in wound size over time.

These findings align with previous studies indicating local anesthetics may interfere with cellular processes critical for wound healing. Lidocaine's transient anti-inflammatory effects may explain its differing outcomes between short and prolonged exposures.



A549 cells were grown to confluence and scratched using a pipetie top. Examplary figures from time T=0 and T=24 of the various assessed conditions.

Conclusion(s): Local anesthetics, particularly bupivacaine, demonstrate inhibitory effects on wound healing in vitro, with pronounced impacts during prolonged exposure. Lidocaine appears less detrimental in short-term applications. These results suggest the need for cautious use of local anesthetics in surgical settings and highlight the importance of further in vivo research to elucidate mechanisms and clinical implications.

41AP04-6

Effect of respiratory acid-base balance on the rocuronium induced neuromuscular blockade and sugammadex induced reversal in the rat phrenic nerve hemidiaphragm

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Background and Goal of Study: In this study, we used an ex-vivo model to investigate the effect of respiratory acid-base balance on the rocuronium-induced neuromuscular blockade and the recovery pattern of sugammadex, both the train-of-four ratio (TOFr) and first twitch tension of TOF (T1) and determined their relationship

Materials and Methods: This ex-vivo study protocol was approved by the Ethics Committee of the Laboratory of Animal Research of the Asan Institute of Life Science (Seoul, Korea) on July 1, 2024 (Protocol No. 2017-13-114). Tissue specimens of the phrenic nerve-hemidiaphragm were obtained from 30 adult SD rats (male, weight 300g). Each specimen was immersed in an organ bath filled with Krebs buffer solution and stimulated with the TOF pattern using indirect supramaximal stimulation at 20-second intervals. After a 30-minute stabilization period, rocuronium loading and booster doses were serially administered at 10-minute intervals in each sample until > 95% depression of T1 was confirmed. Specimens were randomly allocated to the control (95% O2 + 5% CO2), respiratory acidosis (97.5% O2 + 2.5% CO2) and alkalosis (91% O2 + 9% CO2) group and sugammadex concentration 1:1 equimolar dose of rocuronium to produce >95% T1 depressions. Recovery from neuromuscular blockade was monitored using T1 and the TOF ratio simultaneously until the recovery of T1 to > 95% and the TOF ratio to > 0.9.

Results and Discussion: Dose-response curve of T1% and TOFr in acidosis group was shifted to left (p<0.0001) comparing those in alkalosis group. However, There are no differences between those in control and alkalosis group (p=0.026). Recovery progression pattern of sugammadex induced reversal of T1 and TOFr are quite different among these three groups (p=0.0001). However, the regression curve obtained from TOFr was not fit well (p=0.0428). Total dose of rocuronium and sugammadex is different between control vs respiratory acidosis (p=0.0318 in ROC, p=0.0315 in SGX), and between respiratory acidosis vs alkalosis (p=0.0007 in ROC, p=0.0007 in SGX)

Conclusion(s): We suspect that respiratory acid-base changes will be affected the rocuronium induced relaxation and reversal of sugammadex. But it will be needed further suty.

Effect of intravenous magnesium sulphate on neostigmine or sugammadex reversal of rocuronium-induced neuromuscular block - a randomized electrophysiological study

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Background and Goal of Study: Magnesium potentiates the effects of neuromuscular blocking agents by decreasing acetylcholine release from the presynaptic nerve terminal. Its administration after recovery can result in a recurrence of neuromuscular block (NMB). Rocuronium-induced NMB can be antagonized by neostigmine, an anticholinesterase agent, or sugammadex, a selective relaxant binding agent.

The primary aim of this study was to investigate the effect of magnesium on neostigmine- or sugammadex-induced recovery of rocuronium NMB.

Materials and Methods: This double-blind, two-center, IRB-approved randomized study of 48 patients (ASA I-II), aged 18-65 yrs. undergoing elective surgery and patients stratified by sex. Neuromuscular monitoring used normalized acceleromyography (TOF-Watch SX®, Ireland) at the thumb and recorded Train-of-Four (TOF) stimulation q 15 sec. Neuromuscular block was induced with rocuronium 0.6 mg/kg. At the re-appearance of 2 twitches of TOF, patients received either glycopyrrolate (10 µg/ kg) plus neostigmine (50 µg/kg), or sugammadex (2 mg/kg) in a double-blinded manner. Ten minutes after achieving a normalized TOF ratio of 0.9, patients received 60 mg/kg IV magnesium over 5 min. Primary outcome (recurrence of NMB) was defined as 2 consecutive normalized TOF ratio <0.9. Monitoring continued until a normalized TOF ratio of 0.9 returned. Analysis according to group assignment (A or B) was kept blinded and performed with Python v3 and the SciPy statistical library (v1.14.1). Fisher's Exact test evaluated the association between treatment groups (Groups A or B) and recurrence of NMB (a decrease in TOF ratio <0.90).

Results and Discussion: Data were analysed in 45 patients. In group A (n=23), administration of magnesium resulted in recurrence of block in 10 (43.5%) of patients. In group B, 21 of 22 (95.5%) patients experienced recurrence of block. There was a significant association between treatment group (A or B) and TOF ratio decrease; odds ratio of 27.3 (p-value of 0.0002).

Conclusion(s): These findings indicate that magnesium distinctly affects the potentiation of rocuronium residual neuromuscular block reversed with neostigmine versus sugammadex. Further studies are needed to validate these outcomes and improve clinical protocols, particularly for obstetric patients receiving general anesthesia for delivery, where magnesium use is common.

41AP04-8

Predictors of prolonging neuromuscular effects after administration of rocuronium

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Background and Goal of Study: Postoperative residual muscle paralysis is one of major causes of postoperative severe hypoxemia and re-intubation. Anesthesiologists occasionally decide not to administer neuromuscular (NM) reversal agent solely based on the dose and duration of NM agent and the clinical assessments, resulting in severe residual muscle paralysis. No previous study systematically determined the risk factors of prolonging NM blocking effects. This prospective observational study aimed to identify predictors of prolonging NM blocking effect and to assess predictability of the clinical model.

Materials and Methods: The study was approved by our institutional ethical committee and written informed consent from each participant was waved due to non-invasive nature of the observational study.100 adult patients (20-92 ys, 59 males, BMI 15-35 kg/m2) undergoing general anesthesia with rocuronium (Rb) participated in the study. Train of four count (TOFC) was measured every 12 seconds to determine spontaneous TOFC 1 recovery period after initial Rb administration (0.6-0.9mg/kg) (RP1: primary variable) and after additional 10 mg Rb (RP2). Multiple linear regression with backward step-wise method explaining RP1 and RP2 was performed using 10 preselected variables (age, sex, ASA-PS, BMI, albumin, [GTP, total bilirubin, GFR, anesthetics, Rb dose per BW).

Results and Discussion: There was a large variation in RP1 and RP2 among the participants (means±SD, RP1: 48±18, RP2: 32±14 minutes). Independent predictors of prolonging RP1 were identified as higher age (p<0.001), greater BMI (p=0.005) and larger Rb1 dose/BW (p<0.001) (R2=0.302) whereas those of longer RP2 were higher age (p=0.028), lower GFR (p=0.037) and larger Rb2 dose/BW (p=0.017) (R2=0.217). Thus, our results suggest that Rb effects are likely to be underestimated by anesthesiologists in patients with higher age, obesity and renal dysfunction and when larger dose of Rb was administered. The identified predictors are in agreements with reported features of patients with recurarization in the previous literatures. More importantly, the models determined in this study only predict 30 and 22% of the TOFC1 recovery time.

Conclusion(s): Recovery time from rocuronium-induced NM paralysis is unable to be accurately predicted solely based on preoperative patient information, and NM monitoring is necessary to confirm full-recovery of NM function.

Development of rapidly metabolized etomidate derivatives with improved safety and anesthetic performance

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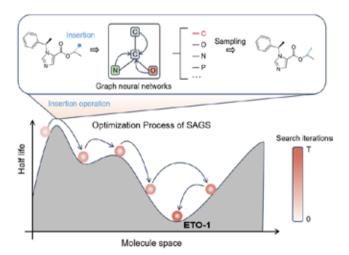
Background and Goal of Study: Since its introduction in the 1970s, Etomidate has been widely used in clinical general anesthesia because of its minimal hemodynamic effects. However, its significant adrenal suppression poses a major limitation to its clinical utility. To address these challenges, AI (SAGS) was used to obtain new molecules with faster metabolism and reduced adrenal inhibition, paving the way for safer and more effective anesthetics.

Materials and Methods:

- 1. Based on SAGS, the structure of etomidate was iteratively refined to shorten its half-life, yielding a lead compound.
- 2. A series of derivatives were synthesized. In vitro and in vivo evaluations were conducted to screen a candidate compound with good anesthetic activity and fast metabolism.
- 3. The anesthetic activity and safety profile of candidate compound were evaluated systematically.

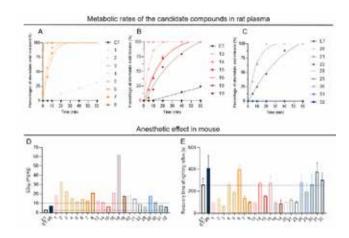
Results and Discussion:

1. Based on Al screening, we found an optimized etomidate derivative as a lead compound.

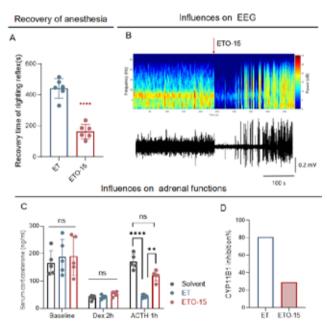


Al screening process

2. In vitro and in vivo results suggest ETO-15, exhibited rapid metabolism and a shorter recovery time, making it a candidate compound.



3. ETO-15 showed better anesthetic activity, a faster recovery time and a weaker inhibition of adrenal function, marking it as a promising candidate in clinical applications.



Conclusions: In the study, we identified a promising compound ETO-15 with a good anesthetic effect and a weaker inhibition of adrenal function, laying the groundwork for subsequent advancements in this field.

Acknowledgements: The National Natural Science Foundation of China (82425054, 82273784)

Effects of sevoflurane concentration and gender on the pathology of malignant hyperthermia in a mouse model

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Background and Goal of Study: Malignant hyperthermia (MH) is caused by inhaled anesthetics. However, it is unknown whether the concentration of inhaled anesthetics affect the onset of MH. We investigated the effect of sex difference and sevoflurane concentration on the onset of MH in RYR1[R2509C] mutant mice (MH model mice).

Materials and Methods: MH model mice were anesthetized with intravenous anesthetics, followed by tracheal intubation and mechanical ventilation. Rectal temperature and heart rate were monitored. Sevoflurane were administered at 1 MAC (2.5%) to male and female MH model mice, and following parameters were compared; time to onset of MH, time to peak temperature, peak temperature, time to maximum heart rate, maximum heart rate, time to death. The onset of MH was defined as when the body temperature exceeded 38°C. Subsequently, sevoflurane were administered at 0.5 MAC (0.5 MAC group) or 1 MAC (1 MAC group) to male MH model mice to examine the effects of the difference of sevoflurane concentration. Data are presented as medians [interguartile range], and statistical analysis was performed using the Mann-Whitney U test, with P < 0.05 considered significant.

Results and Discussion: Male MH model mice (n = 6) showed significantly shorter time to onset of MH, peak temperature, maximum heart rate, and death. The time to onset of MH was 11.5 [10.3-14.3] minutes in male mice and 26.5 [21.5-29.3] minutes in female mice (n = 6) (P=0.01). In the experiments on two different concentration of sevoflurane, the maximum body temperature in 0.5 MAC group (n = 5) was significantly higher than that of 1 MAC group (n = 6) (44.8 [44.6-45.1] °C vs 42.5 [42.3-42.6] °C, P=0.014). The time to onset of MH was 27.0 [22.8-31.3] minutes in 0.5 MAC group, which was significantly slower compared to that of 1 MAC group (P=0.025). No significant differences were observed in other evaluation items.

Conclusion(s): Male MH model mice developed MH more rapidly than females. Lower concentration of sevoflurane showed longer time to onset of MH and greater increase in peak temperature. It is necessary to remind that the exposure to high concentrations of sevoflurane can causes more rapid and more severe symptoms of MH.

41AP04-12

The diagnosis of malignant hyperthermia using cultured skeletal muscle does not differ depending on the location of the muscle biopsy

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Background and Goal of Study: The gold standard for the diagnosis of malignant hyperthermia (MH) is a skeletal muscle contracture test performed using the rectus femoris muscle, specifically the Ca-induced Ca release (CICR) test in Japan. Previously, we reported the usefulness of a diagnostic method using cultured skeletal muscle as an alternative to the CICR test. In this study, we investigated the influence of the muscle sample collection site on the measurement results of this diagnostic method.

Materials and Methods: We retrospectively analyzed data from patients who underwent a CICR test and a diagnostic assay using cultured skeletal muscle for patients suspected of MH susceptibility. Patients were classified into two groups, CICR-positive and CICR-negative, based on the CICR test results. The reactivity (EC50: 50% effective concentration) of cultured skeletal muscle to caffeine (Caf) and 4-chloro-m-cresol (4CmC) was compared between the two collection sites (biceps brachii and rectus femoris). Data are presented as medians (interquartile range), and statistical analysis was performed using the Mann-Whitney U test, with P < 0.05 considered significant.

Results and Discussion: A total of 96 patients underwent both CICR testing and cultured skeletal muscle analysis. Muscle biopsies were performed in the biceps brachii (n=49), rectus femoris (n=37), and other (n=10) muscles. In the CICR-positive group, the EC50 for Caf was 2.9 [2.5-3.3] mM in the biceps brachii (n=33) and 2.9 [2.3-3.3] mM in the rectus femoris (n=24) (P=0.56). The EC50 for 4CmC was 126 [93-153] uM and 137 [112-170] uM in the biceps brachii and rectus femoris, respectively (p=0.33). In the CICR-negative group, the EC50 for Caf was 4.9 [4.4-5.8] mM in biceps brachii (n=16) and 4.9 [4.5-5.0] mM in rectus femoris (n=13) (p=0.68). The EC50 for 4CmC was 243 [220-290] µM and 256 [225-297] µM in biceps brachii and rectus femoris, respectively (p=0.72). Differences in cultured skeletal muscle analysis due to the site of collection have been unknown until now, but the results of this study show that there is no significant difference in the reactivity of Caf or 4CmC between rectus femoris and biceps brachii.

Conclusion(s): The results of functional analysis using cultured skeletal muscle for MH diagnosis are not affected by the site of muscle collection. Collecting muscle tissue from a minimally invasive site will reduce the physical damage on patients.

41AP05-1

Anesthetic management of a patient with Alpha-Gal Syndrome: are all medications labeled as safe truly risk-free? - A case report

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Background: Alpha-gal syndrome results from a hypersensitivity reaction to the carbohydrate galactose
⊓-1,3-galactose (alpha gal) found on the surface of cells of most mammals. The production of IgE antibodies against alpha-gal can cause drug related immediate and red meat delayed-onset anaphylactic reactions.1 Drugs used during the perioperative period can be potential triggers for these reactions, making a thorough anesthetic assessment essential in such cases.

Case Report: A 70-year-old man with alpha-gal syndrome was scheduled for the elective excision of submandibular metastasis from cutaneous squamous cell carcinoma, along with ipsilateral cervical lymphadenectomy. To ensure optimal planning, a detailed evaluation was conducted with the hospital's pharmaceutical team to identify safe medications and surgical materials. Although some literature suggested etomidate as a safe intravenous anesthetic2, the similar emulsion composition of propofol and etomidate raised concerns, as propofol is considered potentially unsafe. A detailed investigation revealed that the etomidate formulation available at our institution contained potential anaphylactic triggers. Lubricants and ointments were also avoided due to the presence of glycerin and/or lanolin in their composition. We will later describe all the drugs used and studied. No allergic reactions occurred in the perioperative period.

Discussion: Managing patients with multiple allergies poses a significant challenge for physicians, particularly when the allergen may be present as an excipient in various drugs. Compounding the complexity is the fact that the same excipient may have different sources (e.g. animal or plant-based), and this information is not always disclosed on medication labels, often necessitating direct communication with the manufacturer for clarification. Therefore, collaboration with pharmacists is essential as well as the review of all excipients in the medications planned for use.

References:

- 1. Dunkman WJ, Rycek W, Manning MW. What Does a Red Meat Allergy Have to Do With Anesthesia? Perioperative Management of Alpha-Gal Syndrome. Anesth Analg. 2019 Nov;129(5):1242-1248
- 2. Leder J, Diederich A, Patel B, Bowie M, Renwick CM, Mangunta V. Perioperative Considerations in Alpha-Gal Syndrome: A Review. Cureus. 2024 Jan 30;16(1):e53208

Learning Points: This case report highlights the importance of multidisciplinary collaboration and analytical reasoning in research evaluation in anesthesiology.

41AP05-2

Remimazolam for procedural sedation: a large multicenter observational retrospective cohort

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Background and Goal of Study: Remimazolam is a novel and reversible benzodiazepine sedative-hypnotic with ultrafast onset and rapid metabolism. The remimazolam literature typically involves a small number of patients undergoing a specific procedure. Here we report the safety and efficacy of remimazolam in over 8,000 patients across three Mayo Clinic sites undergoing a wide variety of procedures.

Materials and Methods: Patients aged 1-100 who received remimazolam at one of three Mayo Clinic sites between June 2021 and February 2024 were retrospectively identified. Demographics, case summaries, anesthetic management including drug and dose administration, and Richmond Agitation Sedation Scale (RASS) scores were abstracted for each patient. Data analysis was conducted in SAS and Python.

Results and Discussion: Our dataset consisted of 8,756 patients (61% male). Of these, 24% underwent surgical and 76% underwent NORA procedures. Most of our patients were ASA 3 or above (1: 1%, 2: 10%, 3: 60%, 4: 28%, 5: 1%). 45% were during MAC anesthesia cases, 35% during general cases without airway, 12% during GETA cases, and 8% during regional or bedside sedation cases. Most were cardiovascular procedures (2112 cardioversions), followed by GI procedures, bronchoscopes, tube insertions, and brain stimulator placements. Remimazolam was most often co-administered with propofol (60% of cases), vasopressors (34%), flumazenil for reversal (14%), and dexmedetomidine (7%). The mean time to return to baseline RASS score was 13 minutes, and mean PACU time was 31 minutes. There were 15 reported allergies to remimazolam, of which two had positive tryptase. There were 11 deaths within 4 hours of remimazolam administration who underwent a secondary in-depth analysis.

Conclusion(s): Remimazolam appears to be a safe and effective anesthetic agent for use in MAC, local, and general anesthesia across a variety of procedures, including in emergent ASA patients (ASA 4-5), to achieve brief periods of moderate sedation, anxiolysis, or deepened sedation in conjunction with other anesthetics. Our PACU and return to baseline RASS times are shorter than those reported in the literature following midazolam or propofol use, indicating that remimazolam may accelerate recovery. The deaths within 4 hours of remimazolam administration from our dataset were unlikely to be directly associated with remimazolam administration. We had two cases of possible anaphylactic reactions to remimazolam.

41AP05-3 Metronidazole toxicity in a 71-year-old female after two months of treatment

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Background: Neurotoxicity associated with metronidazole is a rare complication and only a small number of case reports are documented in the literature. In cases of metronidazole toxicity, bilateral dentate nuclei often demonstrate hyperintensity on T2weighted MR images.

Case Report: We present a 71-year-old female who underwent emergency Hartmann's procedure secondary to a newly diagnosed sigmoid tumour. Her hospital course was complicated by multiple ICU admissions requiring two months (63 days) of metronidazole treatment.

In ICU, the patient had an acute drop in GCS, dysarthria and choreiform seizure like activity of her upper limbs. FAST calls and multiple CT brains showed no acute findings. MRI brain showed abnormal T2/FLAIR high signal within the splenium of corpus callosum, bilateral dentate nuclei, right pons and subcortical white matter in the bilateral frontal and parietal lobes. There was associated restricted diffusion in the fronto-parietal subcortical white matter, corpus callosum and at the grey-white matter interface in the occipital lobes. Lumbar puncture ruled out infective cause. Metronidazole was stopped and her GCS slowly improved.

Discussion: This case demonstrates the serious consequences of a rare side effect of metronidazole. Neurotoxicity mimicked a stroke and meningitis, among many other differentials. Metronidazole neurotoxicity most commonly occurs after prolonged exposure to the drug, however can also occur at low doses. The mainstay of treatment is immediate cessation of metronidazole, and providing supportive care to the patient. Symptoms may take weeks to improve, but in most patients symptoms eventually resolve.

References:

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- 2. D. Quickfall, N. Daneman, A.A. Dmytriw, D.N. Juurlink, 'Metronidazole-induced neurotoxicity.' CMAJ Oct 2021, 193 (42) E1630; DOI: 10.1503/cmaj.20167
- 3. Guglielmo, B.J. 'Metronidazole neurotoxicity: Suspicions confirmed', Clinical Infectious Diseases, 72(12), pp. 2101-2102. doi:10.1093/cid/ciaa400.

Learning points:

- It's important to be aware of the potential neurological complications associated with prolonged use of metronidazole.
- · Recognition of the symptoms and cessation of treatment are crucial in the management of neurotoxicity.
- Most patients will fully recover from their symptoms, however this can often be over a prolonged period

41AP05-4

Reversal of rocuronium-induced fixed pupillary dilation by sugammadex, in an ICU patient after

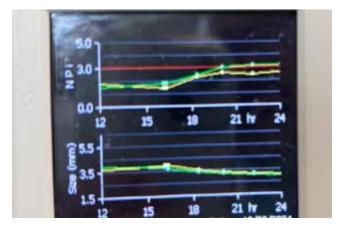
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Background: It is literature reported that rocuronium administration can cause mydriasis, especially in ICU, intubated patients due to COVID. Though not clear, blood brain barrier impairment can

Case Report: A 66yr female ICU patient (70 kg) was transferred to operating theatre for 2ndexploratory laparotomy. She was in ICU for 2 weeks, after being operated for right colectomy and HIPEC due to metastatic ovarian cancer. During transfer to the OR the patient was intubated, with remifentanil, midazolam and low noradrenaline infusion (1 µg/kg/h). During induction fentanyl (150 µg), propofol (40mg) and rocuronium (70 mg) were administered (10 mg of rocuronium were given 60 min later). Anaesthesia was preserved with sevoflurane and low dose of noradrenaline continued intraoperatively. The patient received 8mg morphine for postoperative analgesia. Before induction of anaesthesia both pupils were equal in size and reactive to light (special eye patches were used for protection). Postoperatively pupils were checked, and there was bilateral mydriasis (Size R 4.33, L 4.82) and non-reactive to light (NPi R 0.8, L 0.7). It was suspected that rocuronium caused this side effect and it was decided to administer sugammadex (200mg). There was an immediate improvement in light reflex but laggish in pupils' size. Full eye-recovery was gradual, within 24hours.





Discussion: Intraoperative use of rocuronium in an ICU non-COVID patient caused pupils' mydriasis and depression of light reflex. Reverse of this rare side effect was imminently achieved with sugammadex administration and consequently, other serious CNS causes were excluded

Reference:

M. Winant, et al. BJA 2024 Mar;132(3):627-629

Learning points: Administration of rocuronium in an ICU patient caused mydriasis and depression of light reflex. Use of sugammadex reversed this rare side effect.

41AP05-6

Clinically relevant concentrations of dexmedetomidine affect wound healing dosedependently and time-dependently in vitro

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Background and Goal of Study: Dexmedetomidine is a selective alpha 2 agonist commonly used for anxiolysis, sedation, and analgesia in operating theaters and ICUs, in both adults and pediatric patients, with measured serum concentrations ranging between 0.2 and 20 ng/ml.

Additionally to its sedative and analgesic qualities, several works have suggested improved wound healing. However, these reports examined only specific patient populations and lacked mechanistic aspects. Thus, the effect of dexmedetomidine on wound healing remains poorly understood.

This study aimed to investigate the effect of clinically-relavant dexmedetomidine concentration on wound healing in an in vitro model.

Materials and Methods: A459 human epithelial cells were cultured to 100% confluence, scratched using a pipette tip, followed by media replacement to media with (test) or without (control) dexmedetomidine in clinically relevant concentrations. In a second setting, cells were exposed to =dexmedetomidine for times ranging from 30 to 90 minutes to assess the effect of short-period exposure. Wound healing was studied using serial photography, image analysis was done with the Fiji software and statistical analysis with Prism GraphPad software...

Results and Discussion: Our results showed that dexmedetomidine exposure interfered with scratch closure in a dose-dependent manner - dose increase from 0.02 ng/ml to 2 ng/ml resulted in increasing inhibition of scratch closure in A459 cells, up to complete lack of closure and expansion of the scratch area as compared to controls. Additionally, gradual increase of exposure time from 30 minutes to 90 minutes resulted in a similar inhibition of wound healing rate.

Conclusion(s): In contrast to our hypothesis, our results suggest an inhibitory effect of dexmedetomidine on in-vitro wound healing. These results might be of clinical importance given the growing use of dexmedetomidine in the operating room, emergency departments, and intensive care units. Future research should further characterize the effect of dexmedetomidine on wound healing in cell cultures and to elucidate the participating molecular mechanisms.

41AP05-7

IV Methocarbamol use for pain control in patients undergoing open liver resection

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Background: Muscle cramps occur in 29-88% of patient with liver disease and is only made worse when they undergo open liver resection (1). While epidural placement remains the gold standard for pain control in open abdominal cases, this has gone out of favor in many institutions due to the large hemodynamic shifts that can occur in patients undergoing a liver resection. There has been a large interest in multimodal pain control and enhance recovery after surgery (ERAS) amongst the hepatobiliary community. One of the medications rising in popularity is methocarbamol, a muscle relaxant with a relatively safe drug profile. However the affects of methocarbamol on patients undergoing liver resections have not been well studied.

Case Report: The patient is a 74-year-old female diagnosed with cholangiocarcinoma. She underwent a open liver resection. Pain control was achieved intraoperatively with multimodal combination of acetaminophen, hydromorphone, celebrex, and methocarbamol with bilateral quadratus lumborum 1 block using exparel and 0.25% bupivacaine mixture. The case proceeded uneventfully and the patient was extubated awake and taken to the Post Anesthesia Care Unit (PACU). Shortly after arriving, she complained of pain and another dose of 500mg IV methocarbamol was given. Previous dose was five hours prior. The patient quickly became obtunded and an emergency response was called. She was intubated and an arterial blood gas obtained was consistent with respiratory acidosis. The patient was eventually extubated several hours later.. The rest of her post operative recovery was uneventful.

Discussion: The use of methocarbamol for liver surgical pain control has not been well studied. While the mechanism of action is not known, it's effect is thought to be localized to the central nervous system rather than a direct effect on skeletal muscles. It has been looked at in cirrhotic patients and was shown to be safe to use in those chronic liver conditions, however this has not been looked at in patients with acute injuries. Side effects include drowsiness, headache, and potential respiratory depression when combined with other sedatives. It should be used carefully in elderly patients undergoing liver resections, but otherwise has been shown to be affective for pain control.

References:

1. DOI: 10.1097/MEG.000000000001310, (2) PMID: 18711953 Learning points: Efficacy and safety of IV methocarbamol use in patients undergoing open liver resection

41AP05-8

Rocuronium-Induced anaphylactic shock with reversal after the use of sugammadex: a case report

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Background: Anaphylaxis is a rare but life-threatening condition in the perioperative setting, often occurring during general anesthesia (GA) induction due to the successive administration of multiple drugs, making identification of the causative agent challenging. Among these, rocuronium is most frequently implicated. The use of its antidote, sugamadex, appears to positively impact the reversal of this condition. We present a case illustrating this. Case Report: A 54 yo male, ASA II, was scheduled for laparoscopic bilateral inguinal hernia repair as outpatient surgery. His medical history included hypertension (treated with enalapril) and smoking. He reported an allergy to ibuprofen (hives) and a previous uncomplicated orthopedic surgery under GA. GA was induced with 50ug of fentanyl, 80mg of lidocaine, 160mg of propofol, 20mg of ketamine and 100mg of rocuronium followed by orotracheal intubation. Four minutes later, the patient developed severe hypotension (SBP < 60 mmHg), tachycardia, and bronchospasm, unresponsive to ephedrine ev (total of 20mg) and phenylephrine ev (total of 0,2mg). Anaphylactic shock was suspected, and treatment with adrenaline ev (3 bolus of 0,1mg), 200mg of hydrocortisone ev, 2mg of clemastine ev, IV fluids, and bronchodilators was initiated. Despite these measures, hypotension persisted, requiring norepinephrine infusion, with minimal effect. Suspecting rocuronium's role in anaphylactic shock, 400 mg of sugammadex was administered, resulting in rapid blood pressure normalization. The patient's hemodynamic and respiratory status improved, and he was extubated and transferred to an intermediate care unit for monitoring. On day two, he was discharged and referred to outpatient immunoallergology. Elevated tryptase levels and positive Prick tests exclusively for rocuronium identified it as the trigger for the anaphylaxis, with a recommendation for its future avoidance.

Discussion: Anaphylactic shock was attributed to rocuronium, a rare but life-threatening complication of GA that requires prompt recognition and intervention, even in patients with no previous issues. If suspected, the administration of sugammadex may be crucial for stabilizing the patient.

References:

McDonnell NJ. et al; Sugammadex in the management of rocuronium-induced anaphylaxis; Br J Anaesth. 2011.

Learning points: In suspected rocuronium-induced anaphylaxis, the administration of sugammadex may be effective in treatment and aid in identifying the causative agent.

41AP05-9

Does somatostatin modulate the effects of dobutamine on hepatic blood flow?

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Background and goal: Somatostatin (SOMATO) acts as a portal inflow regulator, influencing hepatic blood flow (HBF). Dobutamine (DOBU), a widely used inodilator, is known to enhance overall intestinal blood flow. However, the effect of dobutamine on HBF in patients treated with SOMATO has not been previously studied. This study aims to evaluate the interaction between dobutamine and SOMATO on HBF.

Methods and materials: After ethical committee approval, patients scheduled for pancreaticoduodenectomy were included in the study. All patients received total intravenous anesthesia via target-controlled infusion of propofol (Schnider model) and remifentanil (Minto model). SOMATO was administered based on surgical requirements. Hemodynamic variables were monitored and recorded using Pulsioflex™. HBF was measured using ultrasound transit time technology (Medi-Stim AS). Baseline measurements (T1) were taken before initiating DOBU at a dose of 2 mcg/kg/min (T2), which was then increased to 5 mcg/kg/ min (T3), maintaining a minimum interval of 10 minutes between measurements. Hemodynamic parameters, indexed hepatic arterial flow (HAFi), and indexed portal vein flow (PVFi) were recorded simultaneously. Patients were categorized into group S (receiving SOMATO) and group C (control). Data analysis was performed using linear mixed modeling.

Results: A total of 30 patients were included. At baseline HAFi was higher and PVFi was lower in SOMATO treated patients. DOBU dose-dependently increased cardiac index and heart rate. The predicted increase in PVFi was 92 ml.min⁻¹.m⁻² (+/- 18 ml.min⁻¹.m⁻²) at T3 (p < 0.05) and the predicted decrease in HAFi was 60 ml.min⁻¹.m⁻² (+/- 18 ml.min⁻¹.m⁻²) at T3 (p < 0.05), both were independent of SOMATO use. The net effect on total HBFi remained similar.

Conclusion: The effects of DOBU in incremental dosages on HBF was similar in both somatostatin-treated and non-treated patients.

41AP05-10

SGLT-2 inhibitors may not be associated with an increased risk of perioperative adverse events

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Sodium-glucose-cotransporter-2 (SGLT-2) inhibitors are antidiabetic drugs increasingly prescribed due to their beneficial effects on cardiovascular mortality. A serious side effect is SGLT-2-inhibitor-associated ketoacidosis which may be perpetuated during perioperative care. Data guiding anesthesiologists on the perioperative risk and safety of SGLT-2 inhibitors are sparse. We hypothesized that preoperative SGLT-2 inhibitor use is associated with higher risks of perioperative adverse events.

This retrospective cohort study included adult patients with diagnosed type 2 diabetes, heart failure and/or chronic kidney disease undergoing surgery between 2020 and 2024 at a tertiary healthcare-center in New England, United States. SGLT-2 inhibitor use within two weeks prior to surgery was identified through prescription records and anesthesia reports. The primary outcome was 30-day adverse postoperative events including major complications, readmission, and death. Secondary outcomes included the components of the primary outcome. In exploratory analysis, we investigated effects of SGLT-2 inhibitors on perioperative arterial blood gas analysis pH values. For statistical analyses, inverse-probability-weighted regression adjustment (IPWRA) including covariates related to patient and procedural characteristics was performed.

Among 21,158 patients, 1,383 (6.5%) used SGLT-2 inhibitors preoperatively, with an increasing trend (3.0% in 2020, 11.1% in 2024. p<0.001). Adverse postoperative events occurred in 13.8% of patients, 11.1% in SGLT-2 inhibitor users versus 14.0% in non-users (odds ratio [OR], 0.76; 95% CI 0.64 to 0.91; p=0.002). This association was not significant following IPWRA (average treatment effect [ATE], -1.73%; 95% CI -3.77 to 0.31; p=0.09). Secondary analyses suggested marginally lower 30-day mortality in SGLT-2 inhibitor users (ATE, -1.12%; 95% CI -1.90 to -0.35; p=0.004). Patients using SGLT-2 inhibitors had lower pH upon first intraoperative arterial blood gas analyses (-0.01; 95% CI -0.02 to -0.01; p=0.004) but comparable incidences of perioperative acidosis with pH<7.3 (adjusted OR, 0.99; 95% CI 0.75 to 1.32; p=0.97).

While surgical patients using SGLT-2 inhibitors had a measurable but clinically irrelevant lower pH, comparable risks of major postoperative adverse events and perioperative acidosis were observed. Future research should explore the lower 30-day mortality and assess perioperative safety and strategies in different populations.

41AP05-12

Intravenous dexmedetomidine prolongs the duration of spinal anesthesia sensory block: a systematic review with meta-analysis

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Background and Goal of Study: Dexmedetomidine (DEX), as an adjuvant for regional anesthesia, promotes sedation, enhances analgesia, and is believed to extend the duration of the sensory block induced by spinal anesthesia. This study aims to analyze the effect of intravenously administered DEX on the duration of the sensory block in spinal anesthesia.

Materials and Methods: A systematic review and meta-analysis of randomized clinical trials (RCT) was conducted using PubMed, LILACS, and Google Scholar databases, according to PRISMA guidelines. The eligibility criteria included RCT published in English, until August 2024, that evaluated the effect of intravenously administered DEX on the duration of the sensory block of spinal anesthesia compared to intravenous saline infusion, based on PI-COS strategy. The weighted mean difference (WMD) was used for continuous variables, and relative risk (RR) for dichotomous variables, with 95% confidence intervals (95% CI). The primary outcome was sensory block duration, and secondary outcomes included the duration of the motor block and postoperative analgesia, bradycardia, and arterial hypotension. A subgroup analysis was performed for bolus versus continuous infusion administration. Rayyan and RevMan 5.4 softwares were used.

Results and Discussion: From 1,552 results, 17 trials were selected, including 627 patients in the control group and 626 in the intervention group. DEX bolus dose and continuous infusion increased the sensory block duration with a WMD of 54.85 minutes $(95\% \text{ CI } [39.13-70.57], I^2 = 99\%, p < 0.00001), which was not ob$ served with exclusive use in continuous infusion (95% CI [-22.52 to 184.34], $I^2 = 100\%$, p = 0.13). Intravenous DEX prolonged the motor block duration with a WMD of 73.10 minutes (95% CI [49.42-96.78], $I^2 = 99\%$, p < 0.00001) and analgesia length with a WMD of 91.59 minutes (95% CI [72.03-111.15], I2 = 99%, p < 0.00001). DEX also increased the incidence of bradycardia (RR = 4.18, 95% CI [2.53-6.90], $I^2 = 0\%$, p < 0.00001), but there was no significant change in arterial hypotension (RR = 1.71, 95% CI [0.99-2.95], $I^2 = 14\%$, p = 0.31).

Conclusion(s): Intravenous DEX administration prolongs sensory and motor block durations of spinal anesthesia and provides postoperative analgesia. There is an increased risk of bradycardia, but not of hypotension.

Reference:

Bharthi SE, Vijayaraghavan U, Sadiqbasha AM. Effect of Intravenous Dexmedetomidine on Spinal Anesthesia. Cureus. 2021 Jun 17;13(6):e15708.

Airway Management

42AP01-2

Use of oxygen insufflation via laryngectomy to prolong apnoeic time for the repair of tracheoesophageal fistula in an adult patient

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Background: The repair of a tracheoesophageal fistula (TEF) through a laryngectomy stoma is an uncommon procedure which poses unique anesthesia challenges. We describe the use of total intravenous anesthesia (TIVA) and oxygen insufflation to provide tubeless anesthesia.

Case Report: A 57 year old male with a laryngectomy was listed for a TEF repair. The otolaryngologist requested for tubeless anesthesia to maximise view of the TEF, and paralysis of the patient to minimise coughing intraoperatively.

We decided to use TIVA to provide anesthesia with paralytics, while placing a 10Fr suction catheter attached to high oxygen flow (10L/min) above the carina through the laryngectomy for apnoeic insufflation, with bag-mask ventilation (BMV) on standby. We observed apnoeic periods for up to 12 minutes. We postulate that this method could potentially permit a longer apnoeic time. albeit not demonstrated here as we prophylactically placed the patient back on BMV before desaturation could occur, before returning to oxygen insufflation again for surgery to continue. The surgery duration lasted 2 hours without desaturation.

Discussion: This simple set up successfully provided tubeless anesthesia, while minimising additional logistical requirement (ie. with jet ventilator) or surgical disruption (ie.with only intermittent mask ventilation).

Limitations include mucosal dessication which may be mitigated by using humified gas for long cases. Barotrauma is a possible although endobronchial insufflation with gas flow of up to 45L/ min has been safely tolerated in the literature¹. Airway soiling is mitigated by placing the patient in Trendelenburg position.

A similar case report utilised oxygen insufflation successfully for the same operation, but the patient was maintained on spontaneous ventilation intraoperatively2. Here, we describe its feasibility in apnoeic patients with equally good results.

References:

- 1. Watson RJ, Szarko R, Mackenzie CF, et al. Continuous endobronchial insufflation during internal mammary artery harvest. Anesth Analg. 1992;75(2):219-225.
- 2. Joynt GM, Chui PT, Mainland P, et al. Total intravenous anesthesia and endotracheal oxygen insufflation for repair of tracheoesophageal fistula in an adult: Anesthesia & Analgesia. 1996;82(3):661-663.

Learning Points: TIVA with oxygen insufflation via the larvngectomy stoma can prolong apnoeic time while providing tubeless anesthesia, thereby minimising surgical interruption for BMV in a TEF repair.

42AP01-3

An innovative technique for extraluminal bronchial blocker application in One-Lung Ventilation for children under two years of age

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Background and Goal of Study: One-lung ventilation (OLV) is a crucial and challenging technique in pediatric video-assisted thoracoscopic surgery (VATS). The right upper lobe bronchus in infant is notably short, making it challenging to achieve an adequate seal with the extraluminal bronchial blocker. We developed a modified approach that combines extraluminal bronchial blocker placement with single-lumen endobronchial intubation to enhance the efficacy of right-side OLV.

Materials and Methods: We reviewed patients under 2 years of age who underwent elective VATS at National Taiwan University Children's Hospital between September 2019 and August 2024. In the standard extraluminal bronchial blocker placement, the blocker's balloon was positioned to occlude the main bronchus on the operative side. For the modified extraluminal bronchial blocker technique, the balloon was adjusted to occlude the Murphy eve. increasing the likelihood of achieving successful one-lung ventilation (OLV) (Figure). This modified technique was introduced for right-sided OLV beginning in April 2023. We conducted a historical cohort comparison to assess whether this modification improved the success rate of OLV.





extraluminal bronchial blocker

Modified extraluminal bronchial blocker

Results and Discussion: A total of 61 patients were included in the analysis, with 40 treated before and 21 treated after the introduction of the modified extraluminal bronchial blocker technique for right-sided OLV. Age, body weight, and carina-to-bronchus distance were similar between the two groups. After April 2023, there was an increase in segmentectomies, and extubation times were shorter in this later group. The incidence of suboptimal operative fields, use of artificial capnothorax, and intraoperative blocker adjustments are presented in the Table.

	Before April 2023		After April 2023	
	L (N=26)	R (N=14)	L (N=11)	R (N=10)
Artificial pneumothorax	4	3	0	1
Suboptimal operation field	4	5	0	1
Intraoperative blocker adjustment	4	3	2	3
Unsatisfactory OLV	8 (30.8%)	7 (50%)	2 (18.2%)	3 (30%)

The modified extraluminal bronchial blocker placement reduced the incidence of unsatisfactory right-sided OLV by 20%.

Conclusion(s): Modified extraluminal bronchial blocker placement is feasible in pediatric patients under 2 years of age and reduces the incidence of perioperative unsatisfactory OLV.

42AP01-4

Innovation to improve lung isolation training for thoracic anesthesia: 3D printed tracheobronchial models

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Background and Goal of Study: Traditional intubation manikins are often expensive and lack anatomical fidelity, particularly in the lower airway, making them suboptimal for teaching lung isolation techniques and double-lumen tube placement. Three-dimensional (3D) printing of tracheobronchial models offers a cost-effective, anatomically accurate alternative for hands-on training, enabling life-sized visualization and practice.

Materials and Methods: In collaboration with the 3D Lab at Hospital de Sant Pau, we designed transparent tracheobronchial models using preoperative computed tomography (CT) scans of male and female anatomy, printed in polylactic acid plastic (PLA).

These models allowed visualization and practice with bronchial blockers (e.g., Cook Arndt®, Cook Cohen®, EZ-blocker®, Univent™) and facilitated training in the placement of right- and left-sided double-lumen tubes.

Workshops were organized annually for residents in anesthesia, pulmonology, thoracic surgery, and intensive care, as well as for anesthesiologists on our team. Each session concluded with a satisfaction survey to evaluate its effectiveness.

Results and Discussion: Participants (grouped in six) rotated through three scenarios:

- Identifying airway structures using a complete 3D airway model with a bronchoscope.
- 2. Practicing right- and left-sided double-lumen tube placement using 3D tracheobronchial models and a bronchoscope.
- 3. Practicing the placement of various bronchial blockers available in daily practice using the 3D models and a bronchoscope. Post-session satisfaction surveys assessed organization, methodology, schedule, teaching, and materials on a 0–4 scale (0 = strongly disagree, 4 = excellent). All categories received an average score of 4, indicating excellent satisfaction.

The 3D models provided an effective and realistic hands-on learning experience, helping participants master techniques for double-lumen tube and bronchial blocker placement through the use of patient-specific models.

Conclusion: 3D printing is increasingly relevant in medicine, particularly for airway management in thoracic surgery. These tracheobronchial models offer a valuable, realistic tool for improving expertise, supporting continuous learning, and training future anesthesiologists in lung isolation techniques.

Reference:

J.Clin. Med. 2024, 13(7), 1848

Acknowledgements: 3D Lab of HSP

42AP01-5

The efficacy of right displacement of trachea on double lumen tube intubation under fiberscope

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Background and Goal of Study: The malpositioning of left-sided double-lumen endobronchial tubes (DLTs) may lead to prolonged intubation time, hypoxia, and an increased risk of airway injury, posing significant threats to patient safety. Over the years, various blind maneuvers have been employed to assist in the placement of DLTs into the left bronchus, including right tracheal displacement and head-turn maneuver. This study aims to evaluate the practical effectiveness of these maneuvers under visualized quidance.

Materials and Methods: Patients undergoing thoracic surgery requiring one-lung ventilation between March 2024 and December 2024 were enrolled in this study. A total of 16 patients participated, with each undergoing the right tracheal displacement maneuver. The primary outcome was the degree of horizontal displacement of the left main bronchus as observed on the screen. The secondary outcome was whether the left main bronchus crossed the screen's midline from the left side due to the maneuver.

Results and Discussion: The average horizontal displacement of the left main bronchus to the right, as observed on the screen during right tracheal displacement, was 6.43%. Fisher's Exact Test revealed a statistically significant association (p=0.018) between the maneuver and displacement exceeding 10% of the screen. As a secondary outcome, one patient (16.66%) showed the left main bronchus crossing the midline from the left side of the screen.

Table 1 Demo	graphy
Case number	N=16
Age	61.9±9.8
Height	163.2±8.9
Weight	65.8±14.5
BMI	24.5±3.7

	Thrust Delta > 10%	Thrust Delta <= 10%	Marginal Row Totals
Pre-Push	0	16	16
Post-Push	6	10	16
Marginal Column Totals	6	26	32(Grand Total)
Statistic value is 0.0177.	The result is signific	ant at p < 0.05	

Conclusion(s): The right tracheal displacement effectively shifted the left main bronchus into a clearer visual field on the screen, facilitating the placement of the double-lumen tube into the left bronchus.

References:

Guan, Jianqiang, et al. "Right displacement of trachea to reduce right bronchial misplacement of left double lumen tube: a prospective, double-blind, randomized study." BMC anesthesiology 22.1 (2022): 1-9

42AP01-6

Hypoxemia during rapid sequence induction and intubation (RSII) in morbidly obese patients: a randomized controlled trial comparing a non-muscle relaxant volatile RSII with intravenous RSII

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Background and Goal of Study: Morbidly obese patients undergoing bariatric surgery are prone to hypoxemia during rapid sequence induction and intubation (RSII). Alternative RSII methods that preserve peripheral oxygen saturation (SpO₂) during the peri-intubation period are required. We hypothesised that volatile RSII combined with airway nerve blocks would be associated with a lower incidence of hypoxemia than traditional intravenous RSII in morbidly obese patients.

Materials and Methods: Forty-two patients aged 18 to 65 years with body mass index>35 kg/m2 undergoing bariatric surgery were randomly allocated.

Intervention: Intravenous RSII (propofol and rocuronium, Group RSII) or airway nerve block followed by volatile RSII (sevoflurane inhalation along with bolus propofol, Group Block).

All patients received videolaryngoscope-assisted endotracheal intubation. The primary outcome was the incidence of desaturation (SpO₂<92%) before and during intubation.

Secondary outcomes included:

A. The peri-intubation lowest SpO_a;

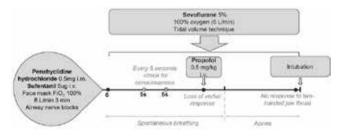
B. Intubation difficulty scale (IDS) scores, first-pass success rates, and intubation time;

C. Peri-intubation hemodynamic parameters.

Results and Discussion: Group Block had a significantly lower incidence of desaturation [4.8% (1/21) vs. 66.7% (14/21); absolute difference, 62%: 95% confidence interval, 34 to 78%: P<0.0001]. and a superior lowest SpO₂ (97% (92 to 98.5%) vs. 88% (80 to 92%), P=0.002). IDS scores in Group Block were slightly higher than those in Group RSII (0.71±0.64 vs. 0.24±0.54, P=0.013).

First-pass success rates were 100% in both groups, and the average intubation time in both groups was comparable (52.2±12.7s vs. 47.4±4.8s, P=0.14). There was a great decrease in rate pressure product in Group Block compared with Group RSII (10949.8±2408.0 vs. 15242.5±3176.9, P<0.01).

Conclusion(s): A combination of airway nerve blocks, sevoflurane, and propofol is a suitable method for RSII that improves hypoxemia and provides good intubation conditions in morbidly obese patients.



42AP01-7

The Airway Terminology and Outcome Measures (ATOM) project to develop a core outcome set for airway management research: identification of candidate outcomes

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Background and Goal: Airway management comprises various procedures for respiratory support. Heterogeneity in outcome reporting across airway management studies hinders evidence synthesis and translation into clinical practice. The Airway Terminology and Outcome Measures (ATOM) project aims to define a core outcome set (COMET 3146) for airway management research by selecting a consensus-based standardised minimum collection of outcomes.

Materials and Methods: We searched MEDLINE, Embase, the Cochrane Central Register of Controlled Trials and ClinicalTrials. gov on 16/11/2023, with search terms used in a systematic review by Ahmad et al. [1] for published and ongoing studies from 2019. We added these to extend the existing database [1] containing studies from 2006 until 2019. We included RCTs and prospective observational studies of adult patients (≥18y) undergoing airway management. Two blinded reviewers screened eligible records in Covidence. We extracted outcomes from 100 random studies. with a 3:1 ratio of interventional to observational studies. Outcomes were considered for final inclusion if used in at least two studies and grouped into domains.

Results and Discussion: 60,023 records were screened and 2,863 were deemed relevant following exclusions, yielding a total of 4,368 studies incorporating those from the previously published review. From the 100 randomly selected studies, 669 outcomes were identified with 480 instruments. Following deduplication and data clean-up, 137 unique outcomes were identified, of which 64 were reported in at least two studies and were included in the final list of candidate outcomes. The most frequently reported outcomes are given in Table 1.

Domain	Outcome	Number of Studies	
Procedural Effectiveness	Time to intubation	44	
	Number of attempts	43	
	Glottic view	24	
Physiology	Ventilation	42	
-	Blood pressure	22	
	Heart rate	13	
Adverse Events	Complications	20	
	Oropharyngeal trauma	19	
	Hypoxaemia	19	
Patient Reported Outcomes	Sore throat	22	
Other	Hoarseness	10	
	Predictors of difficulty	11	

Table 1. Domains with most frequent outcomes.

Conclusion(s): We produced a list of the most frequent outcomes reported in a sample of airway management studies. These will inform a modified Delphi consensus process, where key stakeholders, including patients, clinicians and researchers, will be invited to prioritise them. We aim to identify up to ten agreed core outcomes, with suggested instruments, to be reported in all future airway management studies.

Reference:

1. PMID: 30460982

42AP01-8

Germany

Pre-hospital post-cardiac-arrest-anaesthesia for reintubation of an extraglottic airway to an endotracheal tube - a multicentre observational study

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Background and Goal of Study: Following return of spontaneous circulation (ROSC) in out-of-hospital circulatory arrest (OHCA), post-cardiac-arrest-anesthesia (PCA) is often required, especially if an extraglottic airway (EGA) is to be replaced with an endotracheal tube. The present study examines characteristics, complications and effects of PCA in pre-hospital post-resuscitation-care

Materials and Methods: All emergency interventions between 2019-2021 in Dresden, Gütersloh, and Lippe were analyzed for adult patients with OHCA, unconsciousness, and ROSC to hospital admission. Primary endpoint was the achievement of target parameters of post-resuscitation-care (systolic blood pressure≥100mmHg, etCO2:35-45mmHg, SpO2:94-98%) by the application of PCA. Secondary outcome was rate of re-arrest, as well as additional narcotics used. Propensity-score-analysis was used for evaluation.

Results and Discussion: A total of 391,305 emergency operations with 2.298 OHCA (incidence 0.58%: 95%CI:0.54-0.63) with ROSC were observed until hospital admission in 706 patients (30.7%; w=34.3%; age=68±14 years). PCA for replacing an EGA with an ETI was administered to 152 (31.5%; 95%CI: 27.4-35.9) patients. 44 patients has to be excluded due to incomplete datasets for the propensity-score-matching.

The remaining 106 patients received PCA with Midazolam: n=53(76.9%), Propofol: n=24(34.8%), (S-)Ketamine: n=7(10.1%); Fentanyl: n=40(58.0%), Morphine: n=1(1.4%), Cis-Atracurium: n=7(10.3%) and/or Rocuronium: n=13(18.8%)).

Re-Arrest occurred in n=23(21.7%; PCA: n=7(30.4%) vs. No-PCA: n=16(69.6%)).

Propensity-score-analysis showed that guideline-recommended ventilatory targets (odds ratio (OR): 6.50, 95%CI: 1.47-28.80; p=0.0137) were achieved significantly more often with PCA than without PCA.

However, no evidence of an increased chance of reaching oxygenation targets (OR: 1.20, 95%Cl: 0.37-3,93; p=0.7633) was found. While there was no evidence for an influence on the rate of hypotension at the end of the treatment (OR:1.29: 95%CI:0.48-3.45; p=0,6180), there was evidence for reduced odds for a re-arrest in patients receiving PCA (OR:0.31; 95%CI:0.10-0.94, 0.033). Conclusion(s): Application of PCA for replacement of an EGA with an ETI allows for early achievement of ventilation targets of post-resuscitation-care with no evidence of adverse haemodynamic effects or re-arrest.

42AP01-9

Gastric ultrasound - shining a light on fasting times

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Background: Aspiration of gastric contents is a rare but potentially disastrous anesthetic complication(1). Perioperative fasting guidelines aim to reduce the risk of aspiration in elective and healthy patients, but they may not be enough to patients with certain comorbidities.

Gastric ultrasound is a tool to ensure patient safety when the recommended

fasting times are unreliable or when there are barriers in communication.

Case Report: A 62-year-old woman was scheduled for hallux valgus surgery. Medical history included deafness, grade II obesity, hiatal hernia, gastroesophageal reflux disease (GERD), and depression.

Despite adhearence to a six-hour fasting period for solids, a gastric ultrasound was performed due to her risk factors, revealling both solid and liquid content in the dorsal decubitus position, prompting the postponement of the surgery, and thereby avoiding the patient's exposure to unwaranted risk.

The situation was explained to the patient and her family, and tailored fasting recommendations were provided for a next surgical appointment.

Discussion: Gastric ultrasound is a bedside, non-invasive and reproducible tool that improves patient safety (2).

This case aligns with the rising body of literature that suggests that regular fasting times may not always provide a low aspiration risk in certain patient populations, and inidividualized, more conservative fasting instructions, as well as ultrasound verification, may be necessary to insure patient safety. Considering that gastric pH is the most important factor for pneumonitis, any solid content found in the gastric antrum represents an unacceptable risk in the context of elective surgery for a benign condition

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2. Baettig, S. J., Filipovic, M. G., Hebeisen, M., Meierhans, R., & Ganter, M. T. (2023). Pre-operative gastric ultrasound in patients at risk of pulmonary aspiration: a prospective observational cohort study. Anaesthesia, 78(11), 1327-1337.

Learning Points: Gastric ultrasound is an increasingly accessible tool for assessing aspiration risk in patients with comorbidities, and an improvement in patient safety.

The presence of risk factors for delayed gastric emptying may warrant the implementation of tailored dietary, pharmacological, and behavioral measures to ensure the lowest possible risk of aspiration.

42AP01-11

Pulmonary aspiration during induction of anaesthesia in patients who gastric contents in two patients taking semaglutide for weight loss

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Background: Semaglutide is a new weight loss treatment that has received substantial media attention in recent years. Anaesthetists must be aware of a potentially dangerous side effect of the drug: decreased gastric emptying. This is caused by effects on gastric smooth muscle, mediated by the vagal afferent nerves. This is especially relevant in the peri-operative setting where pulmonary aspiration of gastric contents is a recognised complication (1,2). Here, we report two cases of peri-operativer regurgitation of gastric contents in patients taking semaglutide.

Case Report: Case 1: A 70-year-old male (BMI 35) with multiple comorbidities presented for elective ERCP. Despite 12-hour fasting and using rapid sequence induction, gastric regurgitation occurred during intubation. Oxygen saturation dropped to 83% but stabilized after appropriate interventions. The procedure was completed successfully and the patient was discharged after one

Case 2: A 25-year-old female (BMI 32) on semaglutide for weight loss presented for breast abscess drainage. Despite 8-hour fasting, regurgitation occurred upon LMA removal, requiring emergency intubation. The patient recovered without complications. Both cases highlight potential gastric motility issues in patients using semaglutide, suggesting the need for additional precautions during anesthetic management.

Discussion: Since 2021, semaglutide has gained recognition as a `celebrity weight loss.

A patient taking semaglutide may have a full stomach despite compliance with routine pre-operative fasting guidelines. We consider how to manage patients receiving glucagon-like peptide-1 agonist therapy in the peri-operative period, including identifying those at high risk of regurgitation.

References:

1. Frias JP, Davies MJ, Rosenstock J, et al. Tirzepatide versus semaglutide once weekly in patients with type 2 diabetes. New England Journal of Medicine 2021; 385: 503-515.

2. Somri F, Somri M, Gaitini L, Kharouba J, Gómez-Ríos MÁ. Exploring a novel scavenger for inhalational induction in pediatric anesthesia. A promising approach. J Clin Anesth 2024;94:111375

Learning Points: We are not the first group to suggest a connection between semaglutide and peri-operative aspiration Precautions such as rapid sequence induction and tracheal intubation can be used, but gastric ultrasound may also be useful in the pre-operative environment to help identify patients at high risk of aspiration.

42AP02-1

From skin to airway: employing ultrasonography in the prediction of difficult laryngoscopy and ventilation

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Background and Goal of Study: Predicting difficult laryngoscopy (DL) and ventilation (DV) is a key objective of preoperative evaluation. Traditional clinical indices (modified Mallampati score, thyromental distance, upper lip bite test) have been extensively used, albeit with variable reliability. Recently, ultrasound (US) has emerged as a promising modality for airway assessment. This study aims to evaluate the predictive reliability of specific US indicators for DL and DV.

Materials and Methods: A prospective observational study was conducted in adult patients scheduled for elective surgery under general anesthesia at <a>IHEPA General University Hospital in Thessaloniki, Greece. Preoperative airway evaluation with traditional clinical indices was combined with the following US measurements: thyromental distance (TMD) in neutral head position. TMD at maximal head extension, vocal cord commissure-to-skin distance (VCCSD) and epiglottis-to-skin distance (ESD). Data were analyzed for correlation with DL and DV as binary outcomes. DL was defined as a score of 3 or 4 on the Cormack-Lehane scale and DV as a score of 3 or 4 on the Han scale. Predictive performance of US parameters was computed using receiver operating characteristic (ROC) curve analysis. US measurements were performed by a single trained operator. In all cases, mask ventilation and intubation were performed by a second skilled operator.

Results and Discussion: A total of 230 patients were included in the study, 74 (32.2 %) of whom were female. The median BMI was 25.3 (range: 15.0-46.9) and the median age was 44 (range: 18-94). Our analysis determined that the most reliable predictor of DI was VCCSD (AUC 0.812) with a cut-off value >7.9 mm (86.8% sensitivity, 52.0% specificity). VCCSD was also the most reliable predictor of DV (AUC 0,786) with the same cut-off value (>7.9 mm, 80.0% sensitivity, 44.1% specificity). Due to its high sensitivity but low specificity, VCCSD should be used in conjunction with established clinical indicators.

Conclusion(s): The integration of ultrasonography into preoperative airway evaluation could enhance difficult airway prediction and patient safety. Further studies are warranted to validate these findings so that ultrasonographic airway indicators can be incorporated into airway management algorithms.

References:

Alessandri F. et al. Ultrasound as a new tool in the assessment of airway difficulties: an observational study. Eur J Anaesthesiol. 2019;36:509-515.

42AP02-3

Botulinum toxin masseter injection in progressive bulbar paralysis: Anesthetic management

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Background: Motor neuron diseases (MNDs) are rare neurological disorders affecting upper motor neurons (UMNs) and/or lower motor neurons (LMNs). Progressive bulbar palsy (PBP) is an MND characterized by progressive LMN involvement in the brainstem, impairing the motor neuron signals to facial, lingual, and pharyngeal muscles. Patients with MNDs present significant anesthetic challenges, including potential difficult airway management.

Case Report: A 70v old female with 4v diagnose of PBP scheduled for radical mastectomy presented decreased pulmonary function, facial expression loss, dysphagia, anarthria in the anaesthesiology apointment. On airway observation the interincisor distance was <1cm. The case was brought to multidisciplinary discussion involving the anaesthesiology, neurology and the surgical teams, which led to urgent scheduling of botulinum toxin masseter injection and 3 weeks surgery postponement to allow maximum toxin effect. On the surgery day the patient interincisor distance had improved to 2-3cm. The airway approach was carefully planned and uneventful fiberoptic tracheal intubation was performed under sedation (dexmedetomidine, cetamine) and spontaneous ventilation. Total intravenous anaesthesia was perfomed with propofol infusion, one single bolus of fentanil at surgical incision without NMB. Mechanical ventilation was weaned cautiously at the end of the surgery and adequate ventilation and neurological recovery were rapidly achieved allowing extubation and safe transference to PACU and the ICU care previously arranged wasn't necessary. The patient preoperative neurologic baseline status was unchanged, who went home 5days later.

Discussion: PBP presents significant challenges in anesthetic management due to bulbar dysfunction, respiratory compromise, and sensitivity to anesthetic agents. Early and thorough preoperative evaluation is vital for identifying risks, optimizing the patient's condition, and developing a safe perioperative strategy. In this case, botulinum toxin facilitated improved airway access, highlighting its role in managing trismus secondary to MNDs.

References:

Arora RD, Khan YS. Motor Neuron Disease. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK560774/

Learning points: This case emphasizes the importance of individualized planning and a multidisciplinary team approach to managing MND patients and the usefulness of botulinum toxin masseter injection.

42AP02-4

Evaluation of third generation video laryngeal mask for airway management in general anaesthesia

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Background and Goal of Study: Blind insertion technique is used commonly for laryngeal mask insertion nowadays. But, suboptimal alignment of laryngeal mask using the blind insertion technique is reported in up to 60% of cases. The new video laryngeal mask SaCoVLM was recently invented. This new technology combines laryngeal mask and video camera and promise improvement in insertion technique. Therefore we evaluated the new third generation of video laryngeal mask SaCo VLM in terms of successful insertion rate.

Materials and Methods: In this pilot study, the population were patients without predicted difficult airway undergoing elective surgery in general anaesthesia. In these patients third generation of video laryngeal mask SaCo VLM was used to manage airway. The mask was inserted after induction to general anaesthesia. Our primary outcome was insertion first attempt success rate. Secondary outcomes were number of insertion attempts needed for successful ventilation, total insertion success rate and the time needed to start successful ventilation.

Results and Discussion: Total of 30 patients were enrolled in the study. There was no significant difference in demography of the study population. The insertion first attempt success rate was 90%. In two cases two insertion attempts were needed for successful ventilation. In one case laryngeal mask size 4 was switched with size 5. Then successful ventilation was achieved. The mean time needed for successful ventilation was 12 seconds. Conclusion(s): SaCoVLM, the new third generation video laryngeal mask is a promising new technology to manage airway during general anaesthesia with high first attempt success rate and high overall insertion success rate.

References:

Yan, Cl., Chen, Y., Sun, P. et al. Preliminary evaluation of SaCoVLM™ video laryngeal mask airway in airway management for general anesthesia. *BMC Anesthesiol* **22**, 3 (2022). https://doi.org/10.1186/s12871-021-01541-0

Sun, Y., Zhang, M., Gao, X. et al. Effect of the new video laryngeal mask airway SaCoVLM on airway management in lateral laparoscopic urological surgery: A single center randomized controlled trial. Sci Rep 14, 2132 (2024). https://doi.org/10.1038/s41598-024-51856-4

42AP02-6

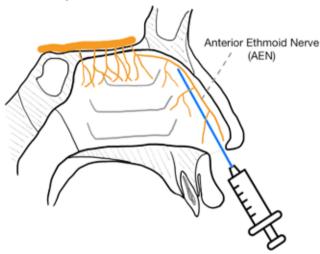
A non-invasive technique of anterior ethmoid nerve block during nasotracheal intubation

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Background and Goal of Study: The anterior ethmoid nerve (AEN), a branch of the nasociliary nerve from the ophthalmic division of the trigeminal nerve, innervates the superior nasal meatus and anterior nasal septum. During nasal intubation, AEN stimulation often triggers abrupt hemodynamic changes via brainstem reflex pathways. To minimize discomfort and maintain stable hemodynamics, we evaluated a non-invasive anterior ethmoid nerve block (AENB) during nasotracheal intubation.

Materials and Methods: Patients undergoing oral or otolaryngological surgery with nasotracheal intubation between January 1, 2024, and October 31, 2024, at Mackay Memorial Hospital were included. AENB patients were matched with non-AENB controls based on propensity scores calculated from age, sex, and ASA classification.

Anesthesia followed a standardized protocol. In the AENB group, 2-3 mL of 2% lidocaine was sprayed into the superior nasal meatus using a syringe with an intravenous catheter, targeting the AEN's origin. If resistance occurred, the syringe was withdrawn until the solution was fully delivered. This ensured precise anesthetic delivery.



Hemodynamic data were analyzed to assess AENB effectiveness. The primary outcome was heart rate change within 20 minutes post-induction, and the secondary outcome was blood pressure change within the same period.

Results and Discussion: A total of 40 patients were included during the retrospective review of cases. Heart rate changes were significantly lower in the AENB group compared to controls (28.6% vs. 49.8%; 95% CI: [-0.3078, -0.1172]; P < 0.01). However, the change in blood pressure did not show statistically significant results (39.8% vs. 7.6%; 95% CI: [-0.2160, 0.8588]; P = 0.2335).

Conclusion(s): AENB significantly reduces heart rate changes, indicating its effectiveness in minimizing stimulation during nasotracheal intubation. This non-invasive technique stabilizes hemodynamic responses and may benefit other procedures involving nasal instrumentation. Further studies with larger populations are needed to confirm these findings and explore broader applications.

42AP02-7

A comparative evaluation of four different periglottic airway devices with preformed shape: A prospective, randomized, comparative, clinical, controlled study

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Background and Goal of Study: Correct placement of secondgeneration supraglottic airway devices is crucial for patient safety and efficient airway management. A less-than-optimal anatomical and functional positioning, can cause clinical malfunction. The aim of this study was to evaluate 4 most popular periglottic airway devices (I-Gel[™], LM Protector[™] LM Fastrach[™], LM Proseal[™]) as regards to ventilation sufficiency and perfection of installation/ anatomical application to the larynx (evaluation with flexible video-bronchoscope).

Materials and Methods: 240 adult patients ASA (I-II) were randomly separated in 4 groups (60 patients in each group) for an elective surgical procedure under general anesthesia. The primary outcome of our study was the adequacy of ventilation which was evaluated with volume leak percent and differences between inspired and expired tidal volume (ΔTV), while secondary outcomes included time for SAD insertion, oropharyngeal leak pressure, perfection of anatomical application to the larynx and complication rate.

Results and Discussion: There were no statistically significant differences in patients baseline and airway characteristics among the 4 groups. Data related to LMA insertion, ventilation sufficiency and complications are presented in Table 1 and Figure 1.

	lgel	Protector	Fastrach	Proseal	P-value
Time of insertion	12.78	17.84	16.92	16.26	*, **, ***
(sec), median, IQR	(12.1-14.8)*,**,***	(16.6-22.5)	(14.5-19.3) "	(15.2-19.0)***	<0.001
Oropharyngeal Leak Pressure (cmH ₂ O), median, IQR	25 (22-31) *."	32 (26-38) *	26 (24-34)	31 (27-38) "	·,•• <0.001
Volume Leak percent (%), median, IQR	3.4 (2.2-4.9)	2.7 (2-4)	2.9 (1.8-4.6)	2.9 (1.7-4.6)	0.53
Fiberoptic Cormack Lehane, n (%) 1	48 (80%)	47 (78.3)	53 (88.5)	46 (76.6)	
Fiberoptic Cormack Lehane, n (%) 2	12 (19.9)	13 (21.6)	7 (11.6)	14 (23.3)	0.63
Complications, n (%)	11 (18.33)*,**	22 (36.05) *	19 (31.04)	20 (32.8)**	*0.03 **0.02

Table 1:

Data are presented as means (SD), medians (interquartile range 25-75, IQR), or as numbers and percentages (%). *******Differences between SADs

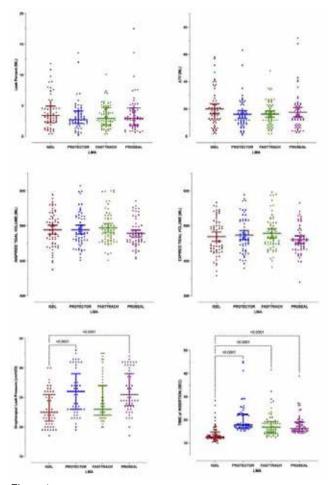


Figure 1:

Conclusion(s): There were no statistically significant differences among the 4 SADs as far as it concerns the ventilation sufficiency and the anatomical application to the larynx. I-Gel™ revealed faster insertion time and lower complication rate. Oropharyngeal leak pressure was significantly higher in LM Protector™ and LM ProsealTM.

42AP02-8

Challenges in airway management during tracheal resection: a case report

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Background: Tracheal malignant lesions are rare and surgical resection presents multiple challenges concerning airway management.1 The anesthetic approach and perioperative management of a large tracheal tumour resection involving six rings near the carina are described.

Case Report: A previously healthy 55-year-old woman was scheduled for resection of a hypervascularised high-grade adenoid carcinoma located 15 mm from the carina, involving six rings and occupying 60% of the tracheal lumen. Awake intubation with fibro bronchoscope was chosen, with cold saline and tranexamic acid applied locally before inserting an 8 cm endotracheal tube past the tumour (Pic1).

In anticipation of the potential need for ECMO due to bleeding from the lesion, incapability of ventilation or surgical potential complications, a multidisciplinary team (anaesthesiology, thoracic and cardiac surgeons) decided to place femoral introducer sheaths to perform a fast guidewire exchange if needed.

During tracheal resection, in-field ventilation of the left bronchus was performed, with brief apnea periods for suturing while maintaining oxygen saturation >90%. Blood loss was minimal, the surgery proceeded without complications and extubation occurred in the OR. Multimodal analgesia, including intravenous and epidural drugs, was administered.



Discussion: Multidisciplinary collaboration is essential for complex airway surgeries to minimize complications. 1When performing direct airway surgery, if a potential difficulty in the patient's oxygenation is anticipated, vascular introducer sheath placement may be considered to ensure easy quick access in case ECMO becomes necessary. Multimodal analgesia, including loco-regional techniques, is vital for pain control, rehabilitation, and preventing pulmonary complications.

Reference:

1. doi:10.1016/j.thorsurg.2024.09.00.

Learning points: Tracheal resection for intraluminal lesions poses significant risks to airway integrity. Proactive planning is crucial to maintain oxygenation, with ECMO as a feasible solution. Collaboration among surgical and anaesthesiology teams is essential for planning complex airway surgeries to minimise complications.

42AP02-9

Hereditary angioedema in a young patient: treading the extubation pathway

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Background: We report a case of a 20 y.o. female patient with previously undiagnosed hereditary angioedema (HAE) who presented with severe acute laryngeal edema, requiring emergency tracheostomy after initial intubation.

Case Report: The patient presented to the emergency room with facial and neck swelling. Her medical history included morbid obesity, depression while receiving oral contraceptives. Despite normal initial direct laryngoscopy (DL), the patient developed acute dyspnea and severe laryngeal edema unresponsive to corticosteroids or adrenaline, resulting in a peri-arrest state and emergency intubation with a 6.0 OT tube. The patient was transferred to the ICU, where HAE was suspected based on her clinical presentation and medical history provided by her parents, and treated accordingly. Due to an acute respiratory deterioration, bronchial toilet was necessary, raising the dilemma of whether to replace the OT tube with a larger size or perform an emergency tracheostomy. Since the former was deemed precarious, a tracheostomy was performed. Despite multiple C1 inhibitor administrations and transient improvement in laryngeal swelling, tracheostoma removal was not possible due to recurrent swelling with each airway maneuver. Her hospitalization proceeded without complications, the diagnosis was confirmed, and she was discharged with the plan to remove the stoma in due time.

Discussion: HAE is a rare cause of laryngeal edema. Nonetheless, diagnosis is necessary as usual approaches, like corticosteroids, are ineffective. Awake intubation with flexible fiber-optic bronchoscope should be employed when possible. There are very few extubation protocols reported in literature for these patients. which mainly include performing a cuff-leak test or DL.1 On the contrary, in our case even performing a DL to assess the degree of laryngeal edema was a potential trigger.

- 1. Floyd E, et al. An extubation protocol for angioedema. OTO Open. 2017 Feb 3;1(1):2473974X17691230.
- 2. Moellman JJ, et al. A consensus parameter for the evaluation and management of angioedema in the emergency department. Acad Emerg Med. 2014 Apr;21(4):469-84.

Learning points: Differentiating laryngeal edema in the emergency setting is challenging but crucial for appropriate treatment. This case highlights that airway management and extubation in such patients can be as difficult as intubation, while further research is needed in establishing appropriate protocols.

42AP02-10

PrediSuisse: Automatized Assessment of difficult airway using three different models of videolaryngoscope with the help of facial recognition techniques and neural network

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Background: Airway management is crucial in every anesthetic procedure with alteration of consciousness. Intubation difficulties are mostly unanticipated and may have disastrous consequences. Accurate preoperative assessment is fundamental to identify patients at risk before anesthesia. Predicting airway difficulties remains a challenging task and there is a lack of consensus on the best method to achieve it. Furthermore, due to the widespread clinical application of recently introduced videolaryngoscopes (VL), we should reconsider traditional predictive methods that are not validated for these tools.

This study aims to predict and classify airway difficulty with VL, using facial recognition techniques and a neural network.

Methods: "PrediSuisse" is a multicentric research project (NCT06453525) including 1800 patients undergoing elective general anesthesia in Switzerland, aimed at predicting the difficult airway using videos of the patients' face processed by an automated smartphone application. Videos of the patients' face will be recorded with an iPhone 15 showing four pre-established facial and head motions during the routine pre-anesthesia consultation. The first phase of the study will consist of training a convolutional neural network (CNN) with these videos. Intubation difficulty will be defined by a panel of 3 airway experts reviewing the recorded images of the intubation acquired by three different models of VL in addition to the subjective assessment of the operator and informative description from the software. The performance of the "PrediSuisse" algorithm will finally be tested on a validating set of patients using inferential statistics (t-tests, ANOVA, and regres-

Secondarily, we aim to identify new morphological features that may be related to difficult tracheal intubation when using three different models of VL with various shapes of blade (MacIntosh, hyperangulated or channeled).

Results: The first patient enrollment will be in early 12/2024. We plan to collect the training set from the first 500 patients in the three participating institutions until early 03/2025, allowing the training of the algorithm. Preliminary results will be presented in

Conclusions: This is the first study aimed at generating a fully automatic software to predict difficult airway using recordings of the intubation process acquired by three different VL with specific blades on a European population.

ESAIC registration: ESAIC_GR_2024_PS

42AP02-11

Diagnosis of newly developed glottis edema (GE) during gastroscope (GC) removal

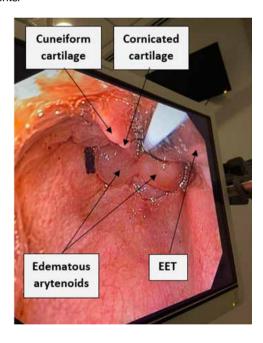
B. Apaolaza¹, A.M. Pola Jiménez¹, C. Salvador Vidal¹, N. Lopetegui Puertas¹, M. Sanz¹, M.J. Salvador Bravo¹ ¹Hospital Universitario de Navarra, Anestesiologia, Pamplona, Spain

Background: Laryngeal injury is usual after endotracheal intubation and, although it is uncommon, it could result in an emergency cricothyrotomy. Therefore, it is essential to assess proper condition of the airway (AW) before extubation.

Case Report: We present an 87-y-o male that was scheduled for an endoscopic extraction of pyloric lithiasis. In the preoperative anesthesia consultation, no predictors of a difficult AW were acknowledged. Following standard general anesthesia induction, the laryngoscope (LC) was inserted and an endotracheal tube (EET) was placed on the first attempt without incidents.

While removing the LC, no sign of laryngeal injury was detected. They performed the procedure and during the removal of the GC a newly developed GE was observed.

Thus, we transferred the patient intubated to the PACU for administration of dexamethasone 4mg/8h. After 24 hours, a cuff leak test (CLT) was performed and the patient was extubated without incidents.



Discussion: Laryngeal injury is common after endotracheal intubation, presenting with varying degrees of edema and limited vocal cord movement that could result in an AW that is neither ventilable nor intubable, where the only life-saving option is a cricothyrotomy. Consequently, if a potential glottic impairment is suspected, it is essential to assess its condition before extubation. In order to do this, we have several tests and the most used ones are CLT, laryngeal ultrasound and video laryngoscope (VL). The first two tests are rapid and non-invasive. However, with the third test, we can assess the AW directly since it is an invasive test.(1) In our case, the gastroscope served the function of the VL without adding the risk of another invasive test: since, we were able to fully visualize the glottis and it had a direct effect on our actions, as we decided not to extubate the patient.

References:

1. Li M, Yan Y, Li P, Zhang L. The difficult removal of tracheal tube after general anesthesia: A case report, 2022/10/7.

Learning points: Routine airway assessment during the removal of the GC is a simple, inexpensive and rapid measure that helps assessing the proper condition of the airway for extubation.

42AP02-12 Novel right lung isolation in bronchus suis

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Background: Bronchus Suis is an anatomical variant of the right main stem bronchus (RMS) seen in 0.1-2% of the population.1 In this variant the RMS typically arises from the right lateral tracheal wall within 2cm of the main carina.1

Case Report: A 66-year-old presented for right upper lobectomy for lung cancer. The patient had undergone CT-imaging and bronchoscopy demonstrating her right upper lobe (RUL) arising from the right lateral trachea above the main carina. The lobectomy required right lung isolation.

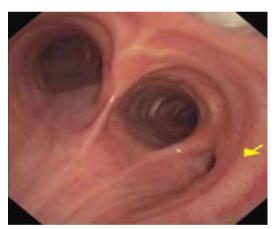


Fig.1 Bronchus suis.

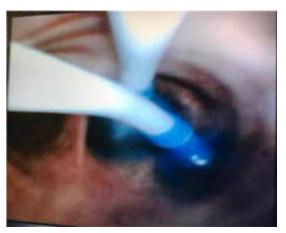


Fig.2 Vivasight view of bronchial blockers in the bronchus intermedius and the right upper lobe.

After induction, a CMAC was used to place a 9.0fr Fuji Uniblocker through the glottis, at a depth of 25cm. After the patient was intubated with the Fuii Uniblocker, an 8.0 Vivasight SLT was placed next to the blocker at a depth of 20cm. Once the Vivasight tube was in place, the Vivasight monitor was used to place the indwelling Fuji Uniblocker in the right bronchus intermedius.

The balloon was inflated to isolate the right middle and lower lobes. Another 9.0fr Fuji Uniblocker was placed through the Vivasight tube and into the bronchus suis, then inflated to deflate the RUL.

Discussion: The Vivasight tube allows for continuous monitoring of the blockers. The Fuji Uniblocker's angled and rigid design allow for ease of placement with the Vivasight camera and no bronchoscope.

References:

Berrocal T, et al. Congenital Anomalies of the Tracheobronchial Tree, Lung, and Mediastinum: Embryology, Radiology, and Pathology. RadioGraphics. 2004;24. Published Online. https:// doi.org/10.1148/rg.e17.

Learning points: This represents a novel technique, in that no bronchoscope was required for placement, and there was continuous visualization of the blockers.

42AP03-1 Soft palate perforation during orotracheal intubation facilitated by the C-MAC videolaryngoscope

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Background: We report a case in which soft palate was perforated during an endotracheal intubation, a difficult airway guided by the C-MAC videolaryngoscope.

There are few records of this type of iatrogenic intubation and its consequences.

Case Report: 51-year-old man, hypertensive, type III obesity with truncal profile. Predictors of difficult airway: poor cervical mobility, body mass index 35, beard, protruding teeth, snorer. We performed general anaesthesia, using a videolaryngoscope and a styletted endotracheal tube. Cormack - lehane I/IV. Technical difficulty in inserting the tube into the pharyngeal cavity due to patient's anatomical characteristics.

After intubation we visualised blood around the tube, and following removing the videolaryngoscope blade we observed soft palate perforation, the tube having passed through it.

Spontaneous cessation of bleeding and assessment by otolaryngologist, deciding on conservative treatment. Uneventful extubation. Subsequent telephone follow-up of the patient: the defect closed spontaneously postoperatively within 10 days.

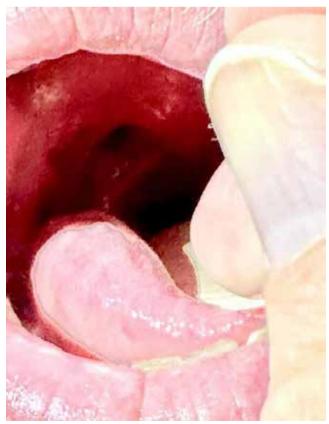
Discussion: The use of a rigid stylet and focus the attention on the C-MAC monitor could probably have been contributory factors to this complication [1].

References:

- 1. Pham Q et al. Soft Palate Injuries During Orotracheal Intubation With th Videolaryngoscope. The Annals of Otology, Rhinology, and Layngology. 2017.
- 2. Long WL et al. Palatopharyngeal wall perforation during glidescope intubation. Anesthesia and Intensive care. 2008.

Learning points: Soft palate perforation during orotracheal intubation is very unlikely, but may be increased by the use of rigid stylet and lack of display of the oral cavity [2]. In case of resistance to inserting the tube, check the structures to avoid injury. Oral mucosa perforation with well-defined borders is usually resolved with conservative treatment.





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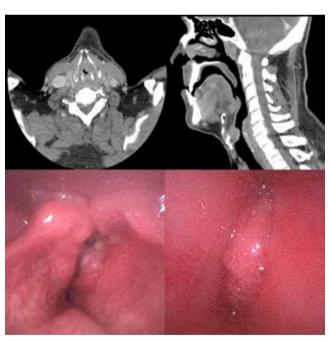
Background: Identifying a difficult airway is crucial for anesthetic planning but even when identified, it can be even more difficult than predicted and raise challenges between the challenge.

Case Report: Male, 50 years old, admitted due to dysphonia and dyspnea for median efforts for study and biopsy throw to suspension microlaryngoscopy (SML). Nasendoscopy previously performed by ORL team showed ulcerovegetative lesion with starting point in left vocal cord, conditioning homolateral hemilarynx paralysis. CT scan the day before surgery showed marked stenosis of the larynx with airway patency.

Awake tracheal intubation using flexible bronchoscopy (ATI:FB) with MLT tube was performed, under high-flow nasal oxygen, sedation with remifentanil, lidocaine topicalization and cooperating patient in spontaneous ventilation. ATI:FB was successful with second operator.

During the procedure, it was visualized the lesion among marked distortion of the larynx, a very small glottis collapsing during respiratory movements. The major difficulty was in subglottic passage. During SML was verified transglottic neoplasm with high risk of airway loss, resulting in tracheostomy.

After tracheostoma, laryngectomy tube was placed for ventilation and direct visualization of the subglottis was achieved with the fibrescope, confirming severe obstruction and eminent airway loss. Tracheostomy tube was placed for airway maintenance.



Discussion: High-flow nasal oxygen, as a pillar of the sTOP technique, was particularly essential on this case, not only to maintain blood oxygenation but to allow some permeability in the airway, and assist the ATI:FB.1 Difficult airway is dynamic, such as diagnosis, depending on physiological factors such as disease progression or edema, and can rapidly aggravate, as in this case, complicating airway and future disease management.

References:

 Ahmad et al, Difficult Airway Society guidelines for awake tracheal intubation (ATI) in adults. Anaesthesia 2020 Learning points: Dynamic diagnosis and its repercussions on difficult airway approach.

42AP03-3

The role of airway ultrasound in the management of a predicted difficult airway

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Background: Managing a difficult airway in urgent or life-threatening situations can be a significant challenge. Traditional airway evaluation methods often have limitations, especially in patients with history of cervical surgery. Ultrasound (US) has emerged as a promising tool for airway assessment due to its accessibility, safety and non-invasive nature.

Case Report: A 71-year-old male was proposed for an urgent exploratory laparotomy for suspected colon ischemia. He was hemodynamically unstable, requiring vasopressor support, and had a Glasgow Coma Scale score of 9. His medical history included vertebromedullary trauma in the cervicothoracic region nine years prior, resulting in paraparesis at the D4 level and a post-tracheostomy status due to prolonged mechanical ventilation. He also had chronic pulmonary disease and required home non-invasive ventilation with cough assist for difficulty clearing secretions. Physical examination revealed limited cervical mobility and edentulism. An US examination was performed for airway assessment. Using a linear probe in a transverse orientation, we measured the following parameters: in the thyrohyoid view, the distance from the skin to the epiglottis (DSE) was 1.9 cm; and in the suprasternal view, the tracheal diameter was 9.6 mm. Intubation equipment was prepared: a size 7 orotracheal tube with a stylet and a videolaryngoscope. A rapid sequence induction was performed due to aspiration risk, and successful tracheal intubation was achieved on the first attempt without complications. Post-surgery, the patient was transferred to the ICU on mechanical ventilation due to multi-organ dysfunction, extubated 12-24 hours later, and discharged home after 21 days.

Discussion: US can offer a fast and valuable enhancement to traditional airway evaluation, especially in urgent cases. Studies suggest that a DSE >2.48–2.54 cm is a reliable indicator for difficult laryngoscopy. In cases of possible tracheal stenosis following tracheostomy, US can assist in selecting the appropriate tube size. This case highlights the potential of US to enhance airway management.

References:

- 1. Lin et al. (2023). Point-of-care ultrasound in airway evaluation and management. Diagnostics, 13, 1541
- 2. Fernandez-Vaquero et al. (2023). Preoperative airway ultrasound in the sniffing position. Braz J Anesthesiol., 73(5), 539-547

Learning points: Ultrasound can be a valuable resource for optimizing airway management, especially in difficult scenarios.

42AP03-4

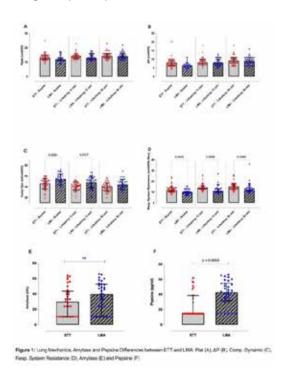
Comparison of laryngeal mask airway Protector™ with endotracheal tube: Evaluation of respiratory mechanical parameters in controlled mechanical ventilation and prevalence of pulmonary microaspiration. A prospective, randomized. comparative, controlled clinical study

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Background and Goal of Study: Supraglottic airway devices are a valuable alternative to endotracheal intubation to maintain airway. The aim of this study is to compare laryngeal mask airway (LMA) Protector™ with the endotracheal tube, regarding to the respiratory mechanical parameters and the prevalence of aspiration.

Materials and Methods: 85 adult patients ASA (I-II) were scheduled to receive endotracheal tube (ETT group, N.=44) or (LMA) Protector™, N=41) for airway management during urology procedures. Assessments included intraoperative lung mechanics (Peak inspiratoty pressure, Dynamic Compliance, Plateau Pressure) in suspine and in lithotomy position, insertion time, success first pass rate, hemodynamics data, and pharyngolaryngeal complications. Assessment of aspiration risk was evaluated by detecting and quantifying pepsin and amylase in bronchoalveolar lavage samples of patients.



Results and Discussion: From 168 consecutive pts 85 pts (44 in ETT and 41 in LMA group) enrolled in the study and included in the analysis. There were no statistically significant differences in pts baseline and airway characteristics between groups. C_{the}was significantly higher while Resistance was lower in the LMA group, at different time points. Pepsine levels was significantly higher in the LMA group while amylase levels were similar between groups. Data related to devices insertion, ventilation sufficiency and complications are presented in Table 1 and Figure 1. Hemodynamics were similar between the two groups.

	ETT (44 pts)	LMA Protector (41 pts)	P-value
Time of intubation or LMA insertion (sec), median (IQR)	31.10 (29.0-35.7)	20.4 (18.7-22.9)	<0.0001
Success First Pass (Yes), no (%)	44 (100)	32 (78.05)	0.001
Leak Fraction at 30 min (%), median (IQR)	1.94 (0.00-3.85)	0.0 (0.0-1.86)	0.041
Peak Inspiration Pressure at 30 min (cmH2O), median (IQR)	19.00 (17.25-21.75)	18.00 (16.00-21.00)	>0.99
Complications, n (%)			
Cough	9 (20.45)	2 (4.88)	0.05
Blood in the device	1 (2.27)	18 (19.51)	0.01

Data are presented as means (SD), medians (interquartile range 25-75, IQR), or as numbers and percentages (%).

Conclusion(s): LMA Protector revealed better ventilation effectiveness, but higher Pepsine levels compared to ETT. Blood was more often in LMA.

42AP03-5

Navigating the airway labyrinth: Innovative awake intubation strategies in complex facial ameloblastoma

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Background: Awake tracheal intubation (ATI) is the gold standard for managing anticipated difficult airways. The modified "sprayas-you-go" (SAYGO) technique, using an epidural multiperforated catheter, efficiently delivers topical anesthetic to minimize hemodynamic responses. Smaller diameter orifices enable reduced flow of local anesthetic, potentially decreasing airway irritation compared to traditional bolus injections (1). This approach was applied in the management of a patient with a facial ameloblastoma, characterized by extensive local invasion and severe airway compromise. Adhering to the ASA 2022 guidelines (2), awake flexible bronchoscopic intubation was performed via the nasal route, incorporating precise airway topicalization.

Case Report: To ensure airway patency, the use of sedative agents was avoided during the procedure. Anterior nasal nerves, the pterygopalatine ganglion, and the nasopharynx were anesthetized using cotton pledgets soaked in a solution of tetracaine (1%) and adrenaline (0,01%) applied to the preselected nostril under nasofibroscopic guidance. Fibroscopy was performed with the endotracheal tube preloaded on the scope, advancing until

a direct view of the carina was obtained. The SAYGO technique was employed to anesthetize the remaining structures. After confirming adequate bilateral lung ventilation, general anesthesia was initiated.



Discussion: Maintaining spontaneous ventilation during awake fiberoptic intubation is crucial to avoid the high-risk "cannot intubate-cannot oxygenate" scenario (2). Advanced airway management requires a multifaceted approach combining meticulous pre-procedural planning, precise technical execution, and comprehensive patient-specific risk assessment. Anesthesiologists must deploy refined topicalization techniques and strategically select airway devices that optimize both surgical access and patient respiratory mechanics.

References:

1. Journal of clinical monitoring and computing, 37(1), 55–62. 2. Anesthesiology, 136(1), 31–81.

Learning points:

SAYGO technique optimizes airway topicalization with minimal irritation.

Spontaneous ventilation prevents critical intubation risks.

42AP03-6

Recurrent airway obstruction and failed extubation: A challenging case of nasopharyngeal mass and oropharyngeal lipoma

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Background: Extubation is a critical phase in the management of anesthetized patients, carrying significant risks of complications. Failed extubation is a potentially life-threatening event arising from multiple factors. While often due to pulmonary or cardiovascular causes, upper airway obstruction can present a unique challenge, particularly when associated with anatomical abnormalities. We present a case of recurrent extubation failure caused by probable superior airway obstruction.

Case Report: A 53-year-old male, ASA II, presented with two months of progressive symptoms, including headaches, diplopia, left hemifacial paresthesia, positional dyspnea, dysphonia, dysphagia and weight loss. Imaging studies revealed a large nasopharyngeal tumor with extensive skull base destruction, carotid canal invasion, sphenoidal sinus involvement and left venous sinus encroachment. The airway was partially compromised, with obliteration of the nasopharyngeal airway space but preserved oropharyngeal and hypopharyngeal air columns. Additionally, a large midline tongue lipoma was identified. The patient underwent an endonasal biopsy under general anesthesia. Two extubation attempts failed due to immediate post-extubation respiratory insufficiency, bronchospasm and superior airway obstruction. Reintubation was required and the patient was admitted to the intensive care unit. A tracheostomy was performed two days later. Discussion: This case highlights the challenges associated with airway management in patients with complex head and neck pathology. The combination of a large nasopharyngeal mass, oropharvngeal lipoma, and potential post-operatively edema created a dynamic and unpredictable airway. While the exact mechanism of recurrent obstruction is unclear, it is likely multifactorial. Our case emphasizes the importance of a thorough preoperative evaluation and multidisciplinary planning to identify potential complications and optimize outcomes.

References:

1. Benham-Hermetz J, Mitchell V. Safe tracheal extubation after general anaesthesia. *BJA Education*, 21(12): 446e454 (2021). doi: 10.1016/j.bjae.2021.07.003

Learning points: Extubation failure should prompt immediate assessment of potential anatomical and physiological contributors. Multimodal imaging and airway risk assessment are essential in patients with upper airway masses. Multidisciplinary collaboration ensures tailored management for complex airway cases, minimizing perioperative risks.

42AP03-7

Orotracheal intubation in a patient with anticipated difficult airway due to laryngeal cancer: A case using videolaryngoscopy and bougie

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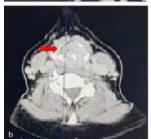
Background: Airway management in patients with laryngeal cancer is challenging. Awake tracheal intubation with a fibrolaryngoscope or videolaryngoscope is recomended in cases of anticipated difficult airway (1).

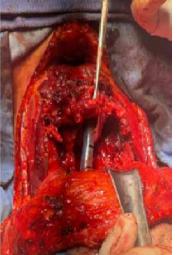
The bougie is usually considered as a rescue device, its use remains limited and is infrequently employed on the first attempt.

Case Report: A 63-year-old woman with stage T3N0M0 laryngeal carcinoma and 90% glottic lumen obstruction was deemed unsuitable for tracheostomy due to potential interference with the surgical access site. Minimal sedoanalgesia was administered to maintain spontaneous ventilation.

Videolaryngoscopy enabled the successful passage of a bougie through the glottis, followed by the insertion of an orotracheal tube through the obstruction. The airway was ultimately secured through tracheostomy at the conclusion of the surgery, without complications.







Discussion: In addition to the standard recommended strategies. a bougie was selected due to its smaller diameter, which facilitated passage through the glottic lumen. Currently, there are no specific guidelines for airway management in cases of obstruction, such as tumors, when endotracheal intubation is preferred as the initial approach.

However, studies suggest that using a bougie during the first intubation attempt may improve success rates, although its application remains limited (2,3).

References:

1. Ahmad I, El-Boghdadly K, Bhagrath R, Hodzovic I, McNarry AF. Mir F. et al. Difficult Airway Society guidelines for awake tracheal intubation (ATI) in adults. Anaesthesia. 2020 Apr;75(4):509-28.

- 2. Wilson SJ, Hendin A, Thiruganasambandamoorthy V. Effect of bougie use on first-attempt success in tracheal intubations: a systematic review and meta-analysis. Can J Emerg Med. 2024 Nov:26(11):781-3.
- 3. Barnicle RN, Bracey A, Weingart SD. Managing Emergency Endotracheal Intubation Utilizing a Bougie. Ann Emerg Med. 2024 Jun; S0196064424002324.

Learning points: Employing a bougie on the first intubation attempt, particularly in patients with difficult airways due to obstruction, may enhance intubation success and reduce complications.

42AP03-8

Airway obstruction from capsule aspiration: timely intervention by a passing anesthesiologist

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Background: Airway obstruction is a leading cause of inadvertent death in children and also poses significant risks to the geriatric population (1). The progressive decline in laryngeal protective reflexes with aging makes elderly patients more vulnerable to lifethreatening events (2).

Case Report: A 92-year-old male patient, hypocoagulated due to atrial fibrillation and hospitalized for digestive bleeding (of unknown etiology but stabilized), was found by the Anesthesiology team in the Gastroenterology Unit. He was sitting at the edge of his bed, leaning forward, conscious but persistently coughing ineffectively. The immediate suspicion was airway obstruction, confirmed by visualization on the monitor of the videocapsule in the distal trachea and carina. The diagnosis of endoscopic capsule aspiration was confirmed. Airway clearance maneuvers were initiated, consisting of 5 back blows followed by 5 abdominal compressions. The patient was encouraged to cough throughout the process. The maneuvers were effective, and the capsule was expelled through the mouth after the fifth abdominal compression. The capsule was then safely placed in the duodenum under direct vision via upper digestive endoscopy with propofol sedation, without further incident.

Discussion: The algorithm for managing airway obstruction by a foreign body, commonly used in out-of-hospital settings, is also applicable in the hospital environment. Anesthesiologists can play a crucial role in managing such medical emergencies within the hospital setting.

Learning Points:

- 1. Early Recognition of Airway Obstruction: Timely recognition of airway obstruction and prompt intervention are critical, especially in elderly patients with diminished reflexes.
- 2. Effective Use of Airway Clearance Maneuvers: Back blows and abdominal compressions can be life-saving techniques when managing airway obstruction from a foreign body, even in the hospital setting.
- 3. Role of Anesthesiologists in Emergencies: Anesthesiologists are vital in managing airway emergencies, utilizing their expertise in airway management to address acute situations effectively.
- 4. Safety Protocols for Endoscopic Procedures: Direct visualization and careful handling during endoscopic procedures ensure safety when placing foreign bodies like videocapsules in the digestive tract.

5. References:

- 1. PLoSOne.2022;17(7):e0269493
- 2. National Safety Council Press, 2003;10-15

42AP03-9

Taping technique in shoulder arthroscopy to minimize cervical edema and prevent airway complications during extubation

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Background: This case report discusses an innovative taping technique for a patient undergoing shoulder arthroscopy. The aim is to generate tissue compression between the shoulder and neck to minimize the outflow of arthroscopic fluid and cervical edema, while increasing airway protection during extubation, as the surgery may involve complications related to extubation due to cervical edema.

Case Report: Anesthesia protocol and orotracheal intubation were performed. The patient was positioned in the lateral decubitus position. Antisepsis of the shoulder was done, and a sterile micropore tape, 100 mm wide, was placed on the skin, laterally to the sternum, at the sixth costal arch anteriorly, over the pectoralis major muscle and sternocleidomastoid muscle, laterally on the cervical area (taking care not to compress the jugular vessels), over the trapezius muscle medial to the clavicle, and along the posterior cervical region in the scapular line, extending to the sixth costal arch posteriorly. Sterile fields were positioned, and punctures for the video trocar placement for joint repair were made.



Measurements were taken of the cervical circumference 1 cm below the thyroid cartilage, the brachial circumference 10 cm below the acromion, and the airway pressure – all measurements were taken after the anesthetic block and at the end of the surgery, to verify variations at different time points.

Discussion: After 60 minutes of arthroscopy, there was no increase in airway pressure. The cervical circumference increased by 0.5 cm, and the brachial circumference increased by 5 cm.

References:

MEMON M, Kay J, GHOLAMI A, SIMUNOVIC N, AYENI O.R. (2018). Fluid Extravasation in Shoulder Arthroscopic Surgery: A Systematic Review. Orthop J Sports Med. 2018;6(5):2325967118771616

Learning Points: The technique was effective and promising, reducing fluid extravasation to the cervical region, not increasing airway pressure, and increasing fluid extravasation to the brachial region, thereby protecting the airway during extubation. Further clinical studies are necessary.

42AP03-10

Comparative evaluation of i-gel insertion techniques: a crossover Manikin study on duration and ease of insertion in two operator positions

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Background and Goal of Study: The i-gel is a second-generation supraglottic airway device (SAD) designed for use in a variety of airway management settings. Conventionally, the i-gel is inserted with the operator standing behind the patients' head, however it can also be inserted from the side of the patient, which may improve functional residual capacity when the patient is in a semi-recumbent position and provide better visualisation of the oropharynx allowing airway manipulation.

The primary outcome of the study was to compare participant's ease of insertion between the two techniques. Secondary outcomes assessed the number of attempts and time taken to successful insertion.

Materials Methods: All study participants were healthcare professionals with varying levels of experience inserting SAD's. A manikin with standard airway anatomy was used in two set up positions. Each participant completed the study inserting a size 3 igel in the two positions; both from behind the head (conventional) and side of the manikin. Attempts were timed, and the number of attempts required for successful insertion were recorded. A pre and post i-gel insertion survey was completed to ascertain participants' comfort level completing both techniques, before and after the study.

Results and Discussion: 30 participants completed the study. 58.6% of participants recognised inserting the i-gel from the side of the patient as an accepted technique. The average insertion time was 4.57 seconds when completed from the conventional position, compared to 3.97 seconds from the side. All participants successfully inserted the i-gel on their first attempt. 37.9% of participants reported feeling more comfortable inserting the i-gel from the side after completing the study, 6.9% indicated discomfort with this approach. There was little change in comfort levels in the conventional group pre- and post-insertion.

Conclusion: I-gel insertion from the side of the manikin was faster compared with the conventional position; with a third of participants feeling more comfortable with the technique following the manikin study.

Increased awareness and teaching of the i-gel side insertion method may aid its implementation into routine clinical practice as a fast and effective alternative technique. This may be useful in emergency situations including trauma, difficult patient positioning and obstructed access to the patient's head.

42AP03-11

Laryngospasm triggered by awake tracheal intubation in a patient with a large neck mass: a case report

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Background: Awake tracheal intubation is needed for a general anesthesia patient with a predicted difficult airway. In this case, the patient experienced laryngospasm during the awake fibreoptic nasal tracheal intubation.

Case Report: A 60-year-old man (ASA II, BMI 21.9) scheduled for neck lumpectomy (81 mm×62 mm mass) with no asthma history, held 5 mL of 2% lidocaine orally for 5 minutes and received 8 L/ min of 100% oxygen via face mask. He received IV penehyclidine 0.5 mg, midazolam 1 mg, and sufentanil 5 µg, along with infusions of dexmedetomidine (0.7 µg/kg/h) and remifentanil (0.05 µg/kg/ min), as well as lidocaine cream and ephedrine for local anesthesia and nasal vasoconstriction. The cricothyroid puncture was not done due to difficulty locating the cricoid by hand palpation because of the patient's large neck mass. As the fibreoptic bronchoscope approached the vocal folds, the patient suddenly coughed, followed by laryngospasm and oxygen saturation to 85%. We provided oxygen under mask pressure and the wheezing subsided. The patient was then positioned sitting up while continuing oxygen, and the laryngospasm was relieved. We conducted an ultrasound-guided cricothyroid puncture and superior laryngeal nerve block, administered inhaled salbutamol and 10 mg IV dexamethasone. Reintubation was successful, and the bronchoscope passed through the glottis without causing laryngospasm.

Discussion: During awake tracheal intubation, patients might face hemodynamic changes, coughing, and decreased oxygen saturation, but laryngospasm is rare. Patients without cricothyroid puncture or larynx nerve block often only experience an irritating cough. Reyes Marquez's study found that patients with laryngeal neuropathy, gastroesophageal reflux, or those lying supine were more prone to laryngospasm.[1] In this case, the large neck mass could have impaired laryngeal nerve function, exacerbating and potentially triggering laryngospasm.

References:

1. Reyes Marquez Altemir, Carmen Gorriz Gil, Virginia Matallama, et al. Phenotypic characterization of laryngospasm: the utility of laryngeal neurophysiological studies. Journal of Voice. 2024 Nov;38(6):1471-1477.

Learning Points: Optimize local anesthesia for the nose, throat, and airway during awake tracheal intubation. Be alert for laryngospasm in patients with chronic cough, asthma, gastroesophageal reflux, or possible laryngeal nerve damage.

42AP03-12

Management of distal tracheal injury after general anesthesia

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Background: Rett syndrome is associated with restrictive pulmonary syndrome, leading to complications like aerophagia and pneumomediastinum. We report a case of a 41-year-old female with Rett syndrome undergoing general anesthesia for dental

Case Report: After an uneventful anesthetic induction and the initiation of mechanical ventilation with protective ventilation parameters, there was a progressive increase in airway pressures, reaching the maximum defined pressure of 40 cmH2O, with a gradual reduction in the tidal volume. The surgery was completed in 15 min, leaving no time to identify the cause of the condition. The patient resumed spontaneous ventilation with a normal respiratory pattern, allowing for extubation without apparent complications. In the Post-Anesthesia Care Unit, the patient developed subcutaneous emphysema and respiratory distress. The Computed Tomography scan revealed pneumomediastinum and raised suspicion of a distal tracheal laceration, later confirmed by bronchoscopy. The multidisciplinary team opted for a conservative approach due to the high surgical risk and the infeasibility of prosthesis placement as determined by the pneumology team. The patient received conservative management with left main bronchus selective intubation (6.0 mm single lumen tube) and mechanical ventilation until spontaneous healing, achieving successful extubation after 19 days.

Discussion: Regardless of the susceptibility to barotrauma in this case, managing distal tracheal lacerations requires positioning the distal end of the endotracheal tube (ETT) and its cuff below the injury. An alternative approach could involve intubating each bronchus with separate tubes and alternating between ventilation and CPAP. It is important to note that other devices, such as double lumen tubes, may not be suitable for managing these injuries, as they increase the risk of trauma and fail to meet the aforementioned requirements.

References:

Schultz, Rebecca J., et al. "Rett syndrome: Genetics, clinical features, and diagnosis". UpToDate, 2024; Boutros, Jacques, et al. "Multidisciplinary management of tracheobronchial injury". European Respiratory Review 31.163 (2022).

Learning Points:

- 1. In distal tracheal lacerations, it is essential to position the distal end of the ETT and its cuff below the injury site.
- 2. Conservative management, including selective intubation and mechanical ventilation, can support spontaneous healing and lead to successful recovery.

42AP04-1

Non-invasive resolution of perioperative airway obstruction in a patient with a giant anterior mediastinal mass

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Background: This case report highlights a critical airway obstruction in a patient with a mediastinal tumour following anaesthesia induction, underscoring the unpredictability of airway management despite normal preoperative imaging. It illustrates the potential effectiveness of non-invasive positional adjustments in managing airway emergencies.

Case Report: A 23-year-old male with a mediastinal tumour underwent preoperative evaluation, showing no symptoms and tolerating the supine position. CT imaging identified a 12 cm irregular anterior mediastinal mass without airway narrowing. Post-anaesthetic induction, the patient experienced significant ventilatory difficulties, indicated by increased airway resistance. After ruling out anaphylaxis and laryngospasm, immediate endotracheal intubation was performed, but airway pressures remained elevated at 41 mmHg. Despite appropriate tube placement confirmed via fibreoptic bronchoscopy, the patient's oxygen saturation dropped sharply to 31%, heart rate to 42 bpm, and ventilation became increasingly challenging. Repositioning to the left lateral decubitus position led to a swift reduction in airway pressure to 23 mmHg, oxygen saturation rose to 97%, and heart rate and blood pressure normalized.

Discussion: This case illustrates the unpredictable airway management challenges posed by mediastinal tumours, despite the absence of preoperative symptoms or imaging suggesting airway compression. The patient's reaction indicates that the tumour's airway impact was dynamic, contingent on positioning and anaesthetic effects (1). Anaesthesiologists must maintain vigilance for airway crises in seemingly stable individuals, as rapid deterioration can occur. Readiness for alternative strategies, including immediate repositioning and auxiliary airway management techniques, is essential. This case emphasizes the critical need for comprehensive preoperative assessment and ongoing intraoperative alertness.

References:

1. Erdös G, Tzanova I. Perioperative anaesthetic management of mediastinal mass in adults. Eur J Anaesthesiol. 2009;26(8):627-32

Learning points: This case highlights the potential for acute airway obstruction following anaesthesia induction in asymptomatic mediastinal tumour patients, highlighting the limitations of preoperative imaging. It stresses the significance of intraoperative positional modifications in reducing airway compression and the necessity for anaesthetists to be equipped for airway emergencies.

42AP04-2

Successful management of post-intubation tracheal laceration after a routine endotracheal intubation

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Background: Post-intubation tracheal laceration (PITL) is an extremely rare, potentially fatal event, with a mortality rate around 22%.1 Diagnosis is based on clinical signs and imaging and it is confirmed by bronchoscopy.1 Decision between conservative and surgical treatment is based on clinical and endoscopic findings.^{1,2} In this report we present a case of PITL after an uneventful intu-

Case Report: A 59 yo, ASA II, female, was admitted for elective laparoscopic cholecystectomy. ASA standard, depth of anesthesia and neuromuscular blockade monitoring was used. Total intravenous anesthesia was conducted. Intubation was uneventful, with a 7.0mm endotracheal tube (ET), without stylet. Surgery proceeded without complications. Neuromuscular blockade was reversed and the patient extubated uneventfully. The patient was transferred to post-anesthesia care unit and later discharged to general ward, without any adverse event. In her room, after efforts to urinate, the patient felt a sharp pain and tinnitus and developed dyspnea, dry cough and facial edema. Subcutaneous emphysema was later palpated. CT-Scan showed bilateral emphysema, pneumomediastinum and a laceration on the posterior tracheal wall. Bronchoscopy confirmed tracheal laceration. The patient did not meet criteria for urgent surgery and was managed conservatively. At postoperative day 10, imaging showed little remaining emphysema and signs of resolved tracheal laceration. Bronchoscopy showed resolution of tracheal laceration. The patient was discharged with complete resolution of symptoms.

Discussion: Overinflation of the cuff and sudden movement of the tube are the two most common causes of PITL.2 In this case, neither tube nor head were moved during surgery. Cuff pressure was not measured and it is impossible to discard or confirm overinflation as the cause for this PITL. Direct tracheal laceration is less likely in this case, since stylet was not used and intubation was simple. We hypothesize that a sensitive pars membranosa, was possibly rendered more susceptible to laceration by the ET cuff. Increased intrathoracic pressure due to strain to initiate voiding, might have been the determining factor for laceration.

References:

- 1. Eur J Cardiothorac Surg. 2009;35(6):1056-1062.
- 2. Ann Thorac Surg. 2000;69(1):216-220.

Learning points:

- Cuff pressure should be measured after every intubation.
- Onset of symptoms after maneuvers that increase intrathoracic pressure should alert for possible PITL.

42AP04-3

Awake intubation in the face of a massive goiter: navigating the airway challenge

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Background: The authors aim to demonstrate the effectiveness and safety of awake tracheal intubation (ATI) in the management of a predicted difficult airway, a technique that remains under-

Case Report: An 87-year-old man presented to the emergency department with progressive dyspnea. Medical background included heart failure of ischemic etiology, smoking, hypertension and right-sided multinodular goiter (Figure 1).

Examination noted stridor, worsening with left lateral decubitus position, and mild tachypnea. A right hemithyroidectomy was proposed. High-flow nasal oxygen (HFNO) was initiated upon the patient's arrival. A remifentanil infusion and 10% lidocaine spray for topicalization were used prior to flexible fiberoptic intubation via the oral route. Due to the patient's lack of cooperation, a propofol infusion was initiated. The procedure was successfully completed, and a size 5 microlaryngoscopy tube was placed. General anesthesia was then induced.

The surgery proceeded uneventfully, and the patient was extubated to HFNO, followed by progressive weaning to a nasal cannula. He was discharged on the fifth postoperative day without dyspnea or any complications.



Figure 1.

Discussion: In this case, managing a predictably difficult airway was mandatory since postponing the procedure was not an option. Progressive airway compromise and patient's inability to tolerate apnea prompted ATI as the procedure of choice. Ultrasound evaluation of the airway revealed significant anatomical distortion. making alternative approaches to airway management technically challenging. The sedation regimen chosen may also be debatable, as propofol, when combined with remifentanil, can increase the risk of respiratory depression. However, ensuring the patient's ability to tolerate airway instrumentation was a key consideration.

References:

1. Ahmad I, El-Boghdadly K, et al. Difficult Airway Society guidelines for awake tracheal intubation (ATI) in adults. Anaesthesia 2020;75(4):509-528.

Learning points: HFNO and patient's tolerability are key to the success of fiberoptic intubation. Head and neck imaging are a valuable tool for airway approach planning.

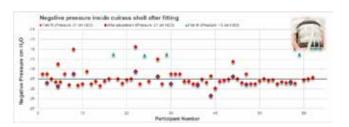
42AP04-4

Biphasic cuirass ventilation in healthy volunteers: a prospective observational study on mounting time and optimal seal

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Background and Goal of Study: Biphasic Cuirass Ventilation (BCV) consists of a shell mounted on the anterior part of the upper body followed by application of extra-thoracic alternating negative and positive pressure has shown great potential in laryngeal surgery.^{1,2} Knowledge of the technical aspects of modern BCV is sparse and this study investigates the time required for fitting a cuirass shell to visible ventilation and obtaining an airtight seal which is required for optimal function of BCV.

Materials and Methods: Sixty-two healthy volunteers (24 males, 38 females, age 41±7yrs, height 173±10cm and weight 73±14kg) were videorecorded during cuirass shell mounting and fitting, followed by initiation of BCV. Fitting time of the cuirass shell was defined as time from initial contact with the shell to visible thoracic movement (mean±SD seconds (range)). Additionally, the correspondence between the preset negative pressure on the ventilator (-15 and -21 cm H₂O for 4 and 58 participants, respectively) and the actual pressure inside the shell was measured. Optimal seal was defined by measured pressure matching set pressure within ±2 cm H₂O. If the pressure difference was larger or if the cuirass shell had visible leak, readjustments were performed.



Results and Discussion: Among the 62 participants, 51 were fitted optimally on the first attempt (mean pressure 21±2 cm H2O, Time 91±21s (65-163). 11 participants required a readjustment to obtain an airtight seal, 5 was due to visible leak and 6 due to suboptimal pressure. For these 11 participants the total time for an airtight seal was 126±28s (98-176). For all 62 participants the total time to obtain optimal fit was 97±26s (65-176). This finding was 5s faster than in a previous study which did not evaluate the fit of the cuirass but compared cuirass mounting-time to intubationtime (177s).3

Conclusion(s): Fitting a cuirass shell and obtaining an airtight seal followed by biphasic ventilation is a relatively quick procedure with a high success rate. BCV may have a place as ventilatory support not only in the elective, but also in acute settings.

References:

1.PMID: 37587006 2.PMID: 37718095 3.PMID: 15101004

42AP04-5

Videolaryngoscopic awake intubation in the sitting position: a case report

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Background: Management of complex airways is a core aspect of anesthesiology and critical care. Ensuring successful outcomes often requires skillful adaptation of techniques to the specificities presented by the clinical case. In this case report, we aim to explore an approach that may be considered for awake tracheal intubation using videolaryngoscopy when the patient is unable to tolerate the supine position.

Case Report: A 58-year-old patient with a known vocal cord neoplasm presented to the emergency department with dyspnea, stridor and inability to tolerate the supine position. Nasal fiberoptic laryngoscopy by Otolaryngology confirmed the laryngeal tumor as the cause, and an indication for urgent tracheostomy was placed. After multidisciplinary discussion, a primary strategy of awake tracheal intubation in the operating room followed by tracheostomy under general anesthesia was chosen.

Upper airway topicalization was obtained with lidocaine spray and nebulized lidocaine with adrenaline and dexamethasone. Intravenous fentanyl was cautiously administered to reduce anxiety and tachypnea. While administering supplemental oxygen via a nasal cannula, a second anesthetist used a MacGrath videolaryngoscope to intubate the trachea with a styletted 5.0 microlaryngeal tube, in a "face-to-face" position. General anesthesia was induced after capnography confirmation of tracheal placement, and tracheostomy and postoperative recovery were uneventful. The patient reported the intubation as only moderately uncomfortable.

Discussion: This case demonstrates that managing complex airways frequently requires adaptation to the clinical scenario and available resources. "Face-to-face" videolaryngoscopic awake intubation may be a valuable alternative for patients with laryngeal tumors unable to tolerate the supine position.

Learning points:

- Clinical evaluation of the patient and a comprehensive understanding of airway management alternatives enabled the development of a patient-tailored plan.
- Adequate oxygenation and airway topicalization are essential to the success of an awake intubation.
- Backup plans must be in place in case the initial approach proves unsuccessful.



42AP04-6

Pulmonary aspiration in the immediate period after stroke, are we even aware of that?

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Background: A key risk of the airway approach is pulmonary aspiration of gastric contents. There are strategies described for prevention in patients at risk.¹

Stroke can lead to gastroparesis, which is underexplored in the immediate period after the event.²

Case Report: An 81-year-old male, ASA IVE, was admitted to the Emergency Department at 1pm due to a stroke confirmed by cerebral angiography. He underwent immediate endovascular revascularisation under analgesia, with no complications.

At 6.30pm, acute ischaemia of the right lower limb was detected, requiring emergency right femoral artery thrombectomy, with no criteria for admission to a level three care unit.

On arrival at the operating room at 7pm, the Glasgow Coma Scale was 7. Balanced general anaesthesia was performed with proper monitoring. Rapid sequence induction was made, with 2.2 µg/ Kg of fentanyl, 1 mg/Kg of lidocaine, 1 mg/Kg of propofol and 1 mg/Kg of rocuronium. After administration of the muscle relaxant, massive vomiting of food content occurred. The patient was placed in the lateral decubitus position and the regurgitated contents aspirated. He was then repositioned to Trendelenburg and conventional laryngoscopy was used for orotracheal intubation. Endotracheal aspiration was carried out, with drainage of the

contents, before the patient was placed on controlled ventilation. Subsequently, a nasogastric tube was placed and 1 litre of gastric content was aspirated.

The procedure was performed without complications, and the patient was extubated uneventfully. On the third post-operative day, right-sided pneumonia was diagnosed. In the following days, his neurological condition deteriorated and he died on the 11th day after the stroke.

Discussion: There must be an awareness to the immediate consequences of stroke, such as gastroparesis, and preventive measures should be developed in these at-risk patients to ensure a safe approach to the airway, especially in emergent procedures under spontaneous ventilation.

Gastric ultrasound prior to induction of anaesthesia can help to detect gastric contents and aid the decision-making in a patient with need of urgent airway protection.

References:

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- 2. Am J Gastroenterol. 2006;101:1655-65.

Learning points: Developing an airway approach plan and adopting preventive strategies for pulmonary aspiration are critical to prevent complications in the immediate post-stroke period, regardless of the preoperative fasting status.

42AP04-7

Practicability and effectivity of the Air-Q3Gsp supraglottic device: a renewed secondgeneration self-pressurizing laryngeal mask

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Background and Goal of Study: 2nd generation LMA had an internal gastric tube what expanded their use. The possibility of drainage gastric secretion, the improvement of materials and the new geometric design enabled a better sealing pressure making them a reliable airway management system. AirQ has released he Air-Q 3G sp, a self-pressurized with gastric access and a endotracheal tube ramp that makes the insertion simplier. The principle of the self-pressurizing is that the fresh gas flows into the cuff of the self-pressurizing SGD and seals it keeping the seal between P_{IP} and the PEEP. The aim of this study is to evaluate the practicability and the effectiveness of the AirQ3G SP

Materials and Methods: Observational study analyzes patient's weight, height, Body Mass Index, AirQ3G SP sizes, number of attempts for insertion, achieving sealing pressure, required inspiratory pressures, proper positioning of the laryngeal mask and patient comfort. All our patients received general anesthesia. Seal pressure achieved was calculated immediately after placing on the laryngeal mask lowering fresh gas flow to 3 lpm; patient was ventilated manually with closing the APL valve stopping when noise through mouth was heard. P was set for a tidal volume of approximately 6 ml/kg always; PEEP 4-5 cm H2O. Mechanical ventilation mode was PVC, alternating with VCV to verify a Driving pressure below 13 cm H2O. Correct placement of the mask was verified using pressure/volume loops and leak volume. Fibroscopy was performed recording the POGO. Patients were asked about any discomfort. Results were collected in Excel data table. Results and Discussion: Patients recruited December 1st 18 (final n: 32 patients) BMI > 25 77,7% BMI>30 22,2% Median pressure: Leak 31cmH₂O. PIP 10 cmH₂O. PEEP 4 cmH₂O. Insertion at first: 94.4% POGO100:100% of patients. Sore throat:0

Conclusion: The preliminary data shows that AirQ3Gsp is a safe. suitable and feasible device for general and/or combined anesthesia in obese patients. The SGD is remarkably easy to insert, ensuring proper placement, making possible intubation through it if becomes necessary. The AirQ3Gsp provides security to the airway thanks to its superior seal pressure; also it seems the AirQ3Gsp cause less sore throat thanks to a lower cuff pressure. The low inspiratory pressure required, combined with the optimal driving pressure measured, provides confidence in operating within a lung-protective ventilation scenario.

42AP04-8

Airway management of cervical abscess with hemorrhage: a case report

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Background: Airway hemorrhage is a critical and potentially catastrophic event, contributing significantly to morbidity and mortality during airway management. (1) This case illustrates a successful strategy in managing a patient with a large upper airway

Case Report: A 57-year-old male. ASA II, with a recent history of acute tonsillitis complicated by peritonsillar abscess drainage. presented for urgent hematoma evacuation and exploratory cervicotomy due to a deep cervical abscess. Despite the absence of respiratory distress, trismus complicated the airway assessment. Cervical CT revealed significant leftward deviation and extensive local edema. Awake flexible fiberoptic bronchoscopy was performed in the presence of the surgical team to maintain spontaneous ventilation after 1 mg of midazolam and topical airway anesthesia. During the procedure, the patient experienced respiratory difficulty, attributed to localized muscle tone loss. However, prompt and effective nasofibroscopy ensured successful airway management without further complications.



At the beginning of surgery, multiple large clots were identified in the oropharynx following the use of a mouth opener. Postoperatively, the patient required mechanical ventilation for suspected necrotizing fasciitis. He was extubated after 13 days without complications and later discharged.

Discussion: Proactive planning and systematic algorithms were key to patient safety. Awake intubation ensured ventilation, while thorough airway assessment, preoxygenation, fiberoptic expertise, and surgical team support contributed to successful management

References:

1. Kristensen, M.S., McGuire, B. Managing and securing the bleeding upper airway: a narrative review. *Can J Anesth/J Can Anesth* **67**,128–140 (2020). https://doi.org/10.1007/s12630-019-01479-5

Learning points: Proactive planning and the use of systematic algorithms are essential for patient safety. Awake intubation plays a critical role in maintaining spontaneous ventilation until the airway is secured. Key factors for success include thorough airway assessment, proficiency in fiberoptic techniques, adequate preoxygenation, and collaboration with the surgical team.

42AP04-9

Airway management challenges in a patient with advanced head and neck cancer: a case report

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Background: Patients with head and neck malignancies who have undergone radiotherapy present significant airway management challenges due to anatomical distortion. These patients are at high risk of obstruction, complicating diagnostic and therapeutic procedures. Pre-procedural planning and a multidisciplinary approach are essential.

Case Report: A 62-year-old male with a history of neck radiotherapy was recently diagnosed with invasive esophageal squamous cell carcinoma. He was scheduled for flexible bronchoscopy to evaluate potential tracheal invasion. Pre-procedural evaluation included endoscopy revealing a friable esophageal lesion causing luminal stenosis, and cervical CT showed an esophageal mass with glottic deviation.

The patient presented with hoarseness but no stridor or respiratory distress. The procedure was performed under deep sedation with spontaneous ventilation, using ASA standard monitoring and BIS. Sedation was induced with alfentanil and propofol, and topical lidocaine was applied.

Early desaturation required placement of a supraglottic airway. Despite high peak inspiratory pressures and irregular expired CO₂, oxygen saturation remained adequate, allowing bronchoscopy to proceed.

Findings included a distorted epiglottis and posterior tracheal compression without invasion or fistula. Post-procedure, the patient exhibited delayed awakening and stridor. Blood gas analysis revealed $PaCO_2$ 141 mmHg. Non-invasive ventilation was started, and otolaryngology evaluation showed a narrow glottic cleft and bilateral immobility of the vocal cords.

After awakening, informed consent was obtained for tracheostomy. Orotracheal intubation via fiberoptic bronchoscopy was performed using a 6.5 mm endotracheal tube to ensure safe trans-

port to the operating room, where tracheostomy was completed. The patient recovered well and was discharged on the sixth post-operative day.

Discussion: This case highlights the challenges of managing airways in patients with head and neck malignancies. Despite being asymptomatic, the patient developed rapid airway compromise requiring advanced techniques. Proactive evaluation, imaging, and a multidisciplinary team are critical to managing high-risk cases.

Learning Points: Airway management in patients with malignancy and radiotherapy requires proactive evaluation, advanced tools, and multidisciplinary collaboration. Contingency planning is key, as even asymptomatic patients may develop critical obstruction.

42AP04-10

Effect of pre-curving endotracheal tube in number of intubation attempts and use of intubation aids: a multi-site prospective service evaluation project

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Background and Goal of Study: Use of intubation aids such as stylets increases risk of airway trauma and limiting number of attempts is recommended to reduce trauma risk [1,2]. Pre-curving the endotracheal tube (ETT) has been suggested to improve first pass success [3] but evidence of its effectiveness is lacking. We aimed to assess the effect of pre-curving the ETT on use of intubation aids and number of intubations attempts in clinical practice.

Materials and Methods: This project received ethical approval from Caldicott Guardian. We tested ETT ability to pre-curve by placing Murphy's eye in 15mm adaptor for 5 minutes and allowing them to stand for 1 minute and then prospectively collected data on predicted difficulty of intubation, whether ETT was precurved, type of laryngoscope used, type of ETT used, type of intubation aids used and number of intubation attempts between 10th – 23rd June 2024 across all three hospitals in Glasgow South sector.

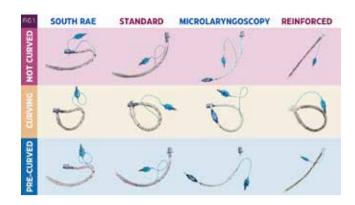
Results and Discussion: All ETT with exception of reinforced ETT were deemed to be pre-curvable (Figure 1) so we excluded reinforced ETT from our analysis. Of 136 patients who received intubation, only 7 (5.1%) had predicted difficult intubation and in 94.1% of cases videolaryngoscope was used.

ETT was pre-curved in 69.1% of cases. No intubation aids were used in 93.6% of intubations with pre-curved ETT, compared to only 50.0% in non-curved ETT group (p<0.001).

In pre-curved ETT group, 95.7% of intubations only required one attempt, compared to 69.0% of first pass success in the non-curved ETT group (p<0.001).

We use an estimated 3400 stylets and 1480 bougies per year at a cost of £14996 per year. Pre-curving our ETT would save £13147 per year and reduce use of single use plastics.

Conclusion(s): Pre-curving ETT significantly reduced need for intubation aids and number of intubation attempts, and would result in significant cost savings and reduced utilisation of single use plastics.



References:

- 1. Boulton, A.J., Smith, E., Yasin, A., Moreton, J. and Mendonca, C. Anaesthesia 2024
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- 3. Ritesh K, Mahima L, Chandrakant P. Anesth Essays Res. 2016 ;10(1):157-8

42AP04-11 Combined technique for managing a difficult airway: a case report

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Background: According to the Difficult Airway Society guidelines, awake tracheal intubation is the gold standard in airway management for a predicted difficult airway, as airway-related complications in anaesthetized patients can be life-threatening.

Case report: A 58-year-old male with a history of larvngeal carcinoma treated with radiation presented in the emergency department with orthopnea, dysphagia and severe cervical pain due to a suspected thyroid cancer with extensive cervical adenopathy. CT scan documented a large anterior cervical mass with left tracheal deviation and narrowed airway (Fig 1).

Due to dysphasia, a surgical percutaneous gastrostomy was requested, which could not be performed under local anesthesia because of his obesity. Airway assessment revealed a Mallampati score III, severely limited neck extension, a large goiter and dyspnea in supine position.

Additionally, the cricothyroid membrane was inaccessible due to the enlarged goiter and airway sonography was not tolerated due to pain.

In the operating room, the patient was positioned at a 45° angle and high-flow oxygen therapy was started at 30 L/min. Airway was topicalised with lidocaine spray and remifentanil infusion was started. Oral fiberoptic intubation was performed to maintain nasal high-flow oxygen.

Fiberoptic technique was uneventful but a resistance to tracheal tube advancement was noted. A combined technique with videolaryngoscopy (VL) was performed revealing a large displaced epiglottis and narrow oropharyngeal space impeding tube progression.

With the displacement of the tongue and elevation of the epiglottis with the VL, successful intubation was achieved and capnography confirmed.

Total intravenous anesthesia was induced.



Fig 1.

Discussion: This case highlights the importance of careful airway assessment and the use of awake tracheal intubation in patients with multiple risk factors for difficult airway management. Successful intubation was facilitated by high-flow oxygen therapy and a combined technique for real-time visualization.

Learning points:

- -Thorough airway assessment is essential for strategy definition.
- -Combined airway techniques enhance intubation performance.

42AP04-12

Systematic review & meta-analysis of videolaryngoscopy vs. direct laryngoscopy in paediatric tracheal intubation: adverse events and safety outcomes

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Background and Goal of Study: Pediatric intubation can be challenging due to specific anatomical and physiological characteristics, which may increase the risk of failure, oesophageal intubation, hypoxia, airway trauma, and cardiac arrest. Videolaryngoscopy (VL) represents a technological advancement over direct laryngoscopy (DL), and has been suggested as a new standard. This systematic review and meta-analysis evaluates the efficacy and safety of VL compared to DL in pediatric patients.

Materials and Methods: We systematically searched MEDLINE, Embase, Cochrane Central Register of Controlled Trials, CINAHL, Web of Science Core Collection, and Scopus on 5 February 2024. The review adhered to Cochrane methodology and included randomized controlled trials (RCTs) comparing VL and DL for tracheal intubation in paediatric patients (<16 years). PROSPERO Registration number: CRD42024498524.

No significant differences were found between VL and DL in failed intubation (RR: 0.8, 95% Cl: 0.53–1.2, p=0.26), oesophageal intubation (RR: 0.49, 95% Cl: 0.16–1.54, p=0.18), or complications (RR: 1.2, 95% Cl: 0.55–2.62, p=0.61).

Subgroup analysis in patients under 1 year of age showed a trend towards fewer failed intubations with VL (RR: 0.71, p=0.07), which was statistically significant for oesophageal intubation (RR: 0.16, p<0.01).

Conclusion(s): These findings suggest that VL and DL have comparable outcomes for pediatric tracheal intubation. Videolaryngoscopy significantly reduces the relative risk for oesophageal intubation in small children (<1y). There is significant heterogeneity in the definitions of failed intubation and reported complications across different RCT. Standardization of outcomes and terminology is needed to reduce this variability and make studies more comparable.

42AP05-1

The role of bedside echocardiography in the diagnosis of pulmonary complications

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Background: Negative pressure pulmonary edema (NPPE) is a form of noncardiogenic pulmonary edema that results from the generation of high negative intrathoracic pressure needed to overcome upper airway obstruction. NPPE is potentially lifethreatening situation developing rapidly in otherwise healthy young people. We describe the use of lung ultrasound (LUS), a tool that has been gaining increasing importance in clinical practice, in a case of NPPE.

Case Report: We present the case of a 17-year-old male patient, ASA II, who underwent emergent surgery for testicular torsion. His medical history included controlled asthma. The procedure, under general anesthesia, was uneventful. During extubation, the patient exhibited reflexive biting of tracheal tube, managed with propofol. He was subsequently extubated without complications. While in the recovery room, the patient developed upper airway obstruction, reversed with jaw thrust maneuvers. Pulmonary auscultation revealed no adventitious sounds. In minutes, patient's condition progressively worsened, presenting with respiratory distress, desaturation to SpO2 82%, and crackles on auscultation. LUS revealed predominant B-lines pattern in all four pulmonary quadrants, suggesting a diagnosis of pulmonary edema. After differential diagnosis of acute onset perioperative pulmonary edema, NPPE was assumed and treatment with furosemide and positive pressure ventilation was initiated, resulting in gradual clinical improvement. The patient was transferred to the pediatric intensive care unit and managed with high-flow nasal oxygen therapy. On the fourth post-operative day he was discharged with full clinical recovery.

Discussion: This case highlights the critical role of bedside echography in the prompt diagnosis and management of post operative pulmonary complications. LUS offers numerous advantages, such as high diagnostic yield, rapid and noninvasive diagnosis, portability, real-time guidance of therapeutic decisions, dynamic assessments, and cost-effectiveness. Therefore is becoming a fundamental skill for anesthesiologists.

References:

1. Caballero-Lozada AF, et al. Bedside ultrasound for early diagnosis and follow-up of postoperative negative pressure pulmonary oedema: case reports and literature review. Anaesthesiology Intensive Therapy. 2019

Learning points: NPPE is a potentially life-threatening that develops rapidly in otherwise healthy young persons. LUS can help promptly diagnose PPCs as NPPE.

42AP05-2

Lung and chest wall compliance measured with the non-invasive PEEP step method during laparoscopic surgery

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Background and Goal of Study: Abdominal surgery is increasingly performed by laparoscopic surgery with insufflation of carbon dioxide in the abdomen, with pressures up to 20 cmH2O, which presses the diaphragm cranially, resulting in a decrease in lung volume.

The purpose of the study was to outline the changes in lung and chest wall compliance (CL, CCW) using a new non-invasive method for separate lung and thoracic mechanics, the PEEP step method (PSM) [1, 2].

Materials and Methods: Eighteen patients undergoing laparoscopic intestinal surgical procedures were included in this observational study. Measurements of lung and chest wall compliance were performed with PSM through a two-step PEEP increase where the end-expiratory lung volume change (ΔΕΕLV) was measured spirometrically after induction (BL), after pneumoperitoneum, and after exsufflation.

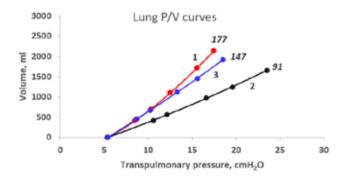


Fig. 1. Pressure/volume curves calculated with the two-step PEEP method. Curve numbers: CL, ml/cmH2O. Red curve: after induction. Black: after CO₂ insufflation with 16 cm H₂O. Blue: after exsufflation.

Results and Discussion: Results: CCW and CL decreased during CO2 insufflation in all patients, CCW from 136±43 to 95±25, CL from 110±31 to 66±14 ml/cmH2O. Transpulmonary driving pressure increased by 50%, from 3,7±0,8 to 6,1±1,1 cmH2O, but the increase was not due to overstretching but to the decrease in lung volume. The PSM software calculated that the optimal PEEP level was 10 cmH2O higher than clinically used, 17 vs. 7 cmH2O. After CO2 exsufflation and supine positioning, CCW and CL recovered to near baseline levels.

Conclusion(s): Lung mechanics and EELV were significantly affected during CO2 insufflation during laparoscopic surgery. The PEEP step method indicates that PEEP should be significantly higher to preserve lung volume during laparoscopic surgery. By measuring before weaning, it's possible to see if lung mechanics have been restored, or if a recruitment manoeuvre may be desirable

References:

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- 42AP05-3 **Breathing through thyroidectomy complications**

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Background: Bilateral recurrent laryngeal nerve injury and cervical hematoma are major complications of thyroid surgery that can significantly challenge airway management and threaten the patient's life. We present a case involving both complications following extubation, leading to imminent compromise of the airway.1 Case Report: A 78-year-old woman, ASA III, underwent an elective total thyroidectomy due to a substernal multinodular goiter. Airway assessment revealed a Mallampati score II and a rightward tracheal deviation on CT. Following induction and successful mask ventilation, intubation was uneventful with videolaryngoscopy. During surgery, iatrogenic bilateral recurrent laryngeal nerve injury occurred, with complete sectioning of the left nerve and uncertain injury to the right. Due to possible airway compromise, the team anticipated a challenging extubation and discussed the airway plan, which was known by all members: use a tube exchanger to assess vocal cord mobility with videolaryngoscopy; extubate if appropriate; and reintubate if needed: Plan A videolaryngoscopy and Plan B surgical airway. After reversing muscle blockade, the left vocal cord showed paresis, the right exhibited slight movement, and both had edema. With spontaneous ventilation and a mobile cord, the tube exchanger was removed, and the patient emerged from anesthesia. However, after a few minutes, she developed an important inspiratory stridor and SpO2 dropped to 89%. Reintubation was promptly decided and Plan A was successful. Immediately after intubation, significant cervical swelling was noted, leading the surgical team to review hemostasis. Postoperatively, the patient was transferred intubated to the ICU, where she was extubated two days later, but required reintubation the next day due to stridor. Following discussion with the otolaryngologist, an elective tracheostomy was performed for persistent stridor and bilateral vocal cord paresis seen on nasofibroscopy. The patient was discharged and continued physiotherapy and speech therapy at home. Seven months later, significant improvement allowed for tracheostomy removal.

Discussion: This case highlights the importance of a multidisciplinary approach and clear strategy definition with effective team briefing. Rapid decision-making and expertise were crucial in identifying and addressing airway compromise. It also underscores the dynamic characteristic of the airway, requiring close monitoring and adaptability in management.

42AP05-4

Lung mechanics during anesthesia for laparoscopic robot-assisted surgery

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Background and Goal of Study: The aim of the study was to measure lung mechanics during anesthesia for robot-assisted surgery using the PEEP step method (PSM).

Currently, there is no simple bedside method to evaluate lung mechanics separately from chest wall mechanics or lung volume changes during CO₂ insufflation and positional changes.

There are also no studies on the individualization of ventilator settings during robot-assisted surgery.

Materials and Methods: Fourteen gynecological and urological patients participated in this observational study. Data for calculating lung and chest wall compliance were collected using a laptop connected to the ventilator.

The Lungbarometry™ software calculates lung compliance (CL) and transpulmonary driving pressure (PL) during a two-step PEEP increase where end-expiratory lung volume change (ΔΕΕLV) was measured by spirometry after induction (BL), after pneumoperitoneum and Trendelenburg position, and before awakening.

Additionally, ΔEELV was measured during CO2 insufflation, CO2 exsufflation, and during tilting.

Results and Discussion: Patients were circulatory and respiratory stable. CL was significantly affected during CO₂ insufflation and tilting down in all patients (BL 133 ± 28 vs. 71 ± 24 ml/cmH_oO, p <0.001). PL increased (+4.6 ± 2.1 cmH2O, p<0.001 vs. BL). After CO₂ exsufflation and returning to the flat position, CL recov-

ered compared to baseline (133 \pm 28 vs. 141 \pm 34 ml/cmH2O, p = 0.491). The decrease in EELV during CO, insufflation and headdown tilting did not recover before awakening (Fig. 1).

The Lungbarometry program suggested an optimal PEEP level that was twice as high as the clinical routine level.

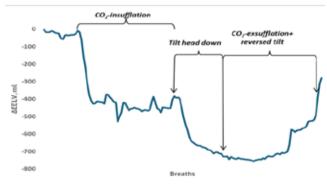


Fig. 1

EELV changes during abdominal CO₂ insufflation + head-down tilting and exsufflation before tilt head-up. Volume changes were measured as the cumulative difference in expiratory tidal volume. Conclusion(s): PSM could be used as a simple bedside tool to measure lung mechanics during surgery. Lung mechanics and EELV were significantly affected during surgery. Our measurement method indicates that a higher PEEP would be beneficial for this type of procedure to preserve lung volume.

42AP05-5

Unexpected Tracheoesophageal Fistula diagnosis under intubated general anesthesia in a post-esophagectomy cancer patient

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Background: Tracheoesophageal fistula (TEF) is a rare but serious complication associated with esophageal malignancies. During general anesthesia, TEF can cause significant ventilatory challenges, including circuit leaks and contamination risks, necessitating immediate recognition and specialized anesthetic management.

Case Report: A 67-year-old man with esophageal cancer, who had an Ivor Lewis esophagectomy two years earlier, presented for esophageal dilation due to recurrent anastomotic strictures. After induction of anesthesia and tracheal intubation, bilateral breath sounds were confirmed. Anesthesia was maintained with low-flow sevoflurane using end-tidal control mode. At a fresh gas flow of 0.5 L/min, the ventilator bellows stopped functioning despite normal readings from the breathing circuit and capnography. Injecting additional air into the endotracheal tube's pilot balloon and increasing the fresh gas flow temporarily restored function. However, during esophagoscopy, the leak recurred, prompting suspicion of a TEF. The anesthetic plan was switched to total intravenous anesthesia (TIVA) to prevent volatile agent contamination. The fistula, located 2 cm above the carina, was confirmed via esophagoscopy and bronchoscopy.



bserved using a suction catheter passed throu escohageal fistula located 2 cm above the cari

Discussion: This case underscores the importance of suspecting TEF in patients with esophageal cancer when unexplained ventilation issues occur under positive pressure ventilation. Early recognition allows interventions that can prevent severe respiratory complications. Key management strategies include positioning the endotracheal tube cuff distal to the fistula to maintain ventilation and reduce leakage, switching to TIVA, and utilizing bronchoscopy and esophagoscopy for precise fistula localization. Minimizing postoperative positive pressure ventilation may reduce the risk of anastomotic breakdown.

Reference:

Parker, R.J. et al. BJA, 100(1):139-140

Learning Points: Suspect TEF in esophageal cancer patients with unexplained circuit leaks. Early diagnosis and tailored ventilation are vital to prevent complications, requiring close anesthesiology-surgery collaboration for optimal outcomes.

42AP05-6

Emergent airway challenge in the intraoperative setting: resolving an acute false passage in a patient with a tracheostomy

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Background: Mechanical ventilation in patients with tracheostomy is often regarded as simple because of the direct access to the airway1. However, there are situations that can be challenging, for example, when a new false passage of the tracheostomy occurs. We present a case where emergent rescue maneuvers were necessary due to difficulties in ventilating a patient through the tracheostomy.

Case Report: A 63 year-old patient started with acute pharyngeal cellulitis and abscess formation extending to mediastinum. In this setting, an emergency cricothyroidotomy was performed. Two days later, he underwent an elective tracheostomy. During the hospital admission, the patient worsened. A thoracic CT scan was performed, showing evidence of mediastinitis aggravation. Therefore, urgent surgery was indicated to perform surgical debridement. The procedure was performed under total endovenous anaesthesia, connecting the patient to the ventilator through the traqueostomy. After that, a bronchial blocker was inserted under fiberoptic visualization in the main right bronchus. One lung ventilation was started and the surgery proceeded without incidents, through a right thoracotomy approach. However, at the end of the procedure, the patient started desaturation and hypotension, and a sudden increase in the peak pressure with a flat capnography trace was evidenced. We deflate the bronchial blocker but, despite of that, these signs maintained and we could not evidence lung ventilation. An emergent fiberoptic view revealed a false passage and, in that moment, we saw a new purulent wound in the anterior cervical region.

Emergency endotracheal intubation was performed in the lateral decubitus position using hyperangulated videolaryngoscopy, revealing glottic edema and periglottic swelling with a narrow passage. Therefore, a 6.5 mm endotracheal tube was introduced. Periods of bilateral lung ventilation were alternated with periods of apnea, and the thoracotomy was closed without incidents.

Discussion: False passages are a recognized but infrequent complication during the intraoperative period2, but it can be lifethreatening. Early detection through clinical signs and monitoring is crucial, with an immediate communication to the surgical team that an unanticipated difficult airway has been declared. In this clinical scenario where there is no patient's oxygenation, emergent measures must be taken.

42AP05-8

Pilot clinical trial to determine the safety of endotracheal intubation with the aid of the 'Airway Shield™' intubation mask in patients undergoing elective surgery

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Background and Goal of Study: Despite recent advances in laryngoscopy, including video laryngoscopy and channelled laryngoscopes, endotracheal intubation (ETI) is often challenging and it is associated with both major and minor complications. The Airway Shield™ is a novel medical device (a mouthpiece canula made of flexible plastic) designed to guide the endotracheal tube (ETT), which follows the laryngoscope blade previously introduced through the device. In addition, the Airway Shield™ protects the patient from the risk of trauma, and the clinician from the aerosols generated during the ETI. In this study, we determined whether the Airway Shield™ is safe and effective to assist in performing ETI with video laryngoscope in surgical patients.

Materials and Methods: Twenty patients undergoing elective surgery under general anaesthesia were recruited for a single-center trial at the Marqués de Valdecilla University Hospital. Five anaesthesiologists performed ETI using the Airway Shield™ in each of the patients. Intubation time and success rate were measured for each attempt. Participants were surveyed at the end of the study to evaluate the ease of intubation using the Airway Shield $^{\mathsf{TM}}$.



Results and Discussion: Of the 20 intubations, 19 were successfully performed with the Airway Shield. Of these, 17 ETIs were successfully completed on the first pass and the remaining 2 on the second pass. The average intubation time was 32.9 seconds. There were no reported complications, neither accidental extubations during the removal of the device. Participants scored the ease of intubation with Airway Shield on a scale of 0-10, with a mean score of 7.6.

Conclusion(s): The Airway Shield device enables successful and safe intubation with short intubation times in patients in the operating rooms, and provides an easy to perform intubation technique as perceived by the operators. This pilot study will provide the basis for future studies involving more patients and more complex settings.

42AP05-9

Challenges in airway management of a child with severe esophageal caustic stricture and undiagnosed dynamic airway obstruction

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Background: who suffer caustic ingestion are at risk of airway seguelae.

Case Report: A 2-year-old African boy, 11kg, with oesophageal caustic stricture, was scheduled for an oesophageal dilation 9 months post-ingestion. He had sialorrhea, nocturnal cough and was fed via a gastrostomy.

After inhalation induction and insertion of an intravenous (IV) catheter, 0.2mg alfentanil and 20mg propofol were administered. Adequate facemask ventilation was confirmed, and 30mg of propofol were administered. Intubation with a 3.5mm tube with a stylet under direct laryngoscopy was uneventful: omega-shaped epiglottis, no identification of arytenoid cartilages, modified Cormack-Lehane 2a.

General anaesthesia was maintained with sevoflurane.

After intubation, bronchospasm occurred and was treated with inhaled bronchodilators.

The oesophageal opening was not identified endoscopically. Bronchoscopy revealed supraglottic fibrosis extending into the hypopharvnx. After spontaneous breathing recovered, the tracheal tube was removed for the remaining examination, which was interrupted by desaturation episodes requiring suction and facemask ventilation. Intermittent airway obstruction due to a laryngeal mass (Fig A) and tracheomalacia (Fig B) was diagnosed. Next, an obstructive breathing pattern and delayed recovery of consciousness were noted. Recovery was achieved following facemask ventilation.

Subsequent nasopharyngolaryngoscopy (Fig C) revealed left cord hypomobility.

Discussion: Late airway complications from caustic ingestion are unpredictable. With obstructive symptoms, there is a high risk of aspiration and hyperreactive airway responses.

Benign obstructive airway conditions can impair spontaneous breathing while under the effect of anaesthetic agents and contribute to a delayed recovery of consciousness due to hypercapnia.

Reference:

1. Payal YS, Sogal PS, Cs P. Corrosive poisoning and its implications on pediatric airways. *Korean J Anesthesiol*. 2023;76(6):643-644.

Learning Points: Difficult airway and high risk of respiratory complications should be expected in children with caustic injuries¹. A timely multidisciplinary evaluation is essential to ensure safe anaesthesia.

42AP05-10

Airway management challenges in a patient with Moebius syndrome: a case report

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Background: Moebius syndrome is a rare, nonprogressive neurological disorder (prevalence 2-20/million births) characterized by facial paralysis and defective extraocular eye movements secondary to congenital paresis of the facial and abducens cranial nerves. These classic features are often accompanied by upper airway, thoracic and diaphragmatic hypotonia, and craniofacial abnormalities which complicate airway management. Affected infants typically present with an immobile, expressionless facies. This case highlights the perioperative difficulties in managing the airway of a patient with Moebius syndrome.

Case Report: An 18-year-old male with Moebius syndrome presented for a corneal suture. General anesthesia with a supraglottic airway device was the first plan of approach. Significant air leaks precluded effective ventilation despite attempts with different sized supraglottic devices. Bag-mask ventilation was difficult. Direct laryngoscopy was unsuccessful due to severe hypotonia, coupled with a lax, omega-shaped epiglottis and anterior glottis. Videolaryngoscopy with a hyperangulated blade and cricoid pressure facilitated successful intubation.

The procedure was uneventful. Challenges resumed at extubation phase. Neuromuscular blockade was reversed with sugammadex, and residual block excluded with quantitative peripheral nerve stimulation. After extubation, facial hypotonia obscured clinical indicators of consciousness and spontaneous ventilation in a desaturating patient. Nasopharyngeal tube placement and multiple secretion aspirations were required. The patient was transported with nasal oxygen and capnography to the postoperative care unit (PACU) for monitoring.

Discussion: This case underscores the complexity of airway management in Moebius syndrome. Facial and pharyngeal hypotonia complicate supraglottic device use and intubation. Videolaryngoscopy proved invaluable in overcoming anatomical challenges. Extubation required a high index of suspicion for inadequate ventilation, emphasizing the need for close monitoring.

Reference:

Orphan Anesthesia. (2024, DEC06). Moebius Syndrome. Available at: https://www.orphananesthesia.eu

Learning Points: Optimal perioperative management in patients with Moebius syndrome demands thorough preparation, alternative airway strategies, and vigilance during recovery. This case reinforces the role of videolaryngoscopy in syndromic airway scenarios and highlights the importance of tailored postoperative care.

42AP05-11

Managing subglottic stenosis safely: awake fiberoptic bronchoscopy with a narrow-bore endotracheal tube: a case report

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Background: Benign subglottic stenosis presents significant challenges for airway management. This case report highlights the management of a patient with severe subglottic stenosis undergoing general anesthesia for abdominal surgery.

Case Report: We report the case of a 51-year-old male with subglottic stenosis (>50%, Cotton-Myer grade II) due to prolonged intubation after polytrauma at age 25 and refractory to surgical treatment. A detailed airway management strategy was devised by the anaesthesiology and otorhinolaryngology team. Awake fiberoptic bronchoscopy was successfully performed. An attempt to advance a size 5.0 endotracheal tube encountered resistance at the stenosis (Fig.1A-1B). A guidewire was introduced through the working channel of the bronchoscope (Fig.1C), enabling the insertion of a 4.4mm tube (Fig.1D). Flow-controlled ventilation (FCV) maintained normocapnia and oxygenation during surgery, with peak pressures of 19 and a PEEP of 5 cmH2O. The patient was extubated in theatre without complications.

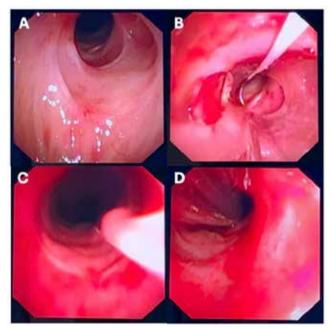


Fig.1. Awake Intubation Sequence

Discusion: The American Society of Anesthesiologists recommends awake intubation for anticipated difficult airways¹. However, in subglottic stenosis, awake intubation alone may fail due to resistance caused by the stricture. While there is limited evidence supporting a single awake technique, fiberoptic bronchoscopy enhances safety by allowing direct visualization of the stenosis. Combining FCV with narrow-bore tubes seems to ensure effective ventilation and oxygenation in severe airway narrowing². The use of a guidewire to intubate with a narrow-bore tube following fiberoptic bronchoscopy has not been documented but was successful and safe in this case as it allowed direct airway visualization.

References:

- 1. Jeffrey L, et al. Anesthesiology 2022;136:31-81;
- 2. Filauro M. et al. Acta Otorhinolaryngol Ital. 2022;42(2):189-93 Learning Points: Preoperative planning and multidisciplinary collaboration are critical for managing complex airways. Combining awake fiberoptic intubation with guidewire narrow-bore tube insertion and FCV ensures safe intubation and adequate oxygenation in patients with narrowed airways.

42AP05-12

The Aintree Intubation Catheter in an unexpected difficult airway: a case report

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Background: The Aintree Intubation Catheter (AIC) is a bougie tube with a larger internal diameter (4.7 mm) than standard airway exchange catheter. In a context of unexpected difficult airway it allows placing a pediatric fiberoptic bronchoscope through its lumen to guide the exchange of a supraglottic device [(laryngeal mask (LM)] to an endotracheal tube (ETT) (1). Our Anesthesiology Department of Donostia University Hospital (DUH) found out recently the existence of de AIC and started to evaluate its utility in several patients.

Case Report: The patient is a 27 years old man. After recurrent episodes of acute epiglottitis, the patient is scheduled for resection of the lingual tonsil, lymphoid tissue of the base of the tongue, and mucosa of the epiglottis.

Due to the presence of several predictors of difficult airway (marked retrognathia, prominent teeth), the decision is made to attempt intubation with a Storz video laryngoscope: the epiglottis and abundant pharyngeal lymphoid tissue are visualized, obstructing the view of the glottis. The next attempt is made with a pediatric bronchoscope in the sleeping patient, but again, there is poor visualization of the laryngeal anatomy. The airway is successfully secured with an I-gel LM, size 4, with an acceptable fit. The AIC with a pediatric bronchoscope loaded into it is used successfully to exchange the laryngeal mask airway to a size 7 ETT. Between each intubation try, the patient is ventilated with a face mask or LM, maintaining oxygen saturation above 97%.

Discussion: In the DUH, after rescuing an unexpected airway with a LM, we normally use the "tube-over-tube" technique to exchange it for an ETT. This process can be technically challenging and has the potential risk of damaging the airway.

After testing the AIC in several patients and given this case, we consider that the visualization with the fiberscope allows for a more careful and safe exchange, potentially reducing the risk of airway trauma (1), as well as direct confirmation of the final placement of the ETT in the trachea. In addition, its usage is technically easy.

References:

Aintree intubation catheter - airway device difficult airway tutorials [Internet]. Ufl.edu. [cited 2024 Dec 3]. Available from: https://vam.anest.ufl.edu/airwaydevice/aintree/index.htm Learning points: After rescuing an unexpectedly difficult airway with a ML, the AIC allows for a safer exchange to an ETT with continuous visualization of the process.

42AP06-1

Retrograde intubation: case series at a tertiary care oncology set-up: time to revisit the technique?

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Background: Retrograde intubation can be successfully used in awake, sedated, obtunded, or apneic patients who have either an anticipated or unanticipated difficult airway. The American Society of Anaesthesiologists (ASA) describes retrograde intubation as an alternative approach to difficult intubation in the non emergent pathway as per their difficulty airway algorithm. It also serves as a valuable skill when fibreoptic scope isn't available. We discuss two cases of difficult airway managed at a tertiary care onco-centre with retrograde intubation: One with conscious sedation with dexmedetomidine, and another with usage of airway blocks

Case Report: Case 1: C/o Ca buccal mucosa posted for CR+MND+PMMC flap. Mouth opening <1FB with limited neck extension due to post radiotherapy changes. Retrograde intubation done after airway topicalization with Mckenzie technique and dexmedetomidine infusion.

Case 2: C/o ameloblastoma lower alveolus posted for central arch segmental mandibulectomy= neck dissection+ free fibular flap. Retrograde intubation done after airway topicalization with Mckenzie technique and B/L Superior laryngeal + transtracheal blocks

Discussion: These two cases aim to emphasize the feasibility of awake retrograde intubation with both conscious sedation with dexmedetomidine and airway blocks. Awake retrograde intubation is avaluable assest in the armammetorium of an anaesthesiologist, especially in a resource limited setting without access to state of the art difficult airway equipments, including a fibreoptic scope.

References:

- 1. Dhara SS. Retrograde tracheal intubation. Anaesthesia. 2009; 64: 1094-1104
- 2. Reena RV (2018) Limited mouth opening: retrograde intubation revisited. Saudi J Anaesth 12(2):349-351.

Learning points:

- 1. Retrograde intubation is a feasible rescue airway management technique which can prove to be valuable especially in a resource limited setting.
- 2.Skill like Retrograde intubation should be a part of the difficult airway management algorithm, which will make it an integral part of teaching learning curriculum. It is advised that residents should undergo training of RI through audiovisual methods, in manikin simulators or cadavers . Familiarity with this simple and quick technique will lead to higher success rates even during emergency difficult airway scenarios.

42AP06-2

Frova as a rescue tool during awake videolaringoscopy: a case report

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Background: Managing a difficult airway (DA) can be challenging for anesthesiologists. Predicting complications, proper planning, and a multidisciplinary approach are essential for ensuring patient safety and successful intubation [2].

Fiberoptic bronchoscopy, the gold standard for DA management, may not be suitable in certain cases such as when nasal obstructions or important bleeding are present [1].

Moreover, recent guidelines emphasize the importance of combining techniques and tailoring airway strategies to approach the airway effectively [2].

This case presents a DA management approach using videolaryngoscopy and a Frova introducer following initial failures with fiberotic bronchoscopy.

Case Report: A 75-year-old female, ASA III, with hypertension, type 2 diabetes, and a multinodular goiter causing tracheal deviation, was scheduled for total thyroidectomy. Intubation attempts using videolaryngoscopy and awake nasal fiberoptic bronchoscopy failed due to significant nasal epistaxis, postponing the surgery. This was later attributed to a nasal polyp.

The patient was scheduled for its removal and orotracheal intubation with C-MAC® videolaryngoscope was successfully achieved under remifentanil infusion and topical airway anesthesia with lidocaine 10%.

The first two attempts with a 7.0 and 6.0 tube failed due to inability to progress through the glottic narrowing. The third attempt succeeded with the Frova introducer facilitating intubation by providing a guide for a 6.0 tube through the restricted airway. Thyroidectomy was later performed with fiberoptic-guided intubation, reflecting resolution of airway challenges after polyp re-

Discussion: This case highlights the Frova introducer key role in difficult airway management and its use in awake videolaryngoscopy, enabling successful intubation when other techniques

Multidisciplinary collaboration and planning were essential for the outcome. It highlights the importance of nasal obstructions and adapting airway management strategies for patient safety and procedural success.

References:

1. Miller, R. D. (2020). Miller's Anesthesia (9th ed.). Elsevier. 2. American Society of Anesthesiologists. (2020). Practice Guidelines for Management of the Difficult Airway. Anesthesiology, 132(1), 1-33.

Learning points: Managing a DA demands preparation, teamwork, and flexibility. A clear, defined plan paired with effective collaboration can significantly improve patient outcomes.

42AP06-3

Airway management in a patient with Goldenhar syndrome and prior history of difficult intubation

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Background: Goldenhar syndrome (GS) is a rare congenital disorder characterized by hemifacial microsomia with ear, eye, and vertebral bodies anomalies. Cardiac, renal and respiratory involvement may occur. Challenges in airway management should be anticipated primarly due to mandibular hypoplasia and cervical spine malformation¹.

Case Report: A 15-year-old male patient with GS, ASA III, was admitted for unilateral ear reconstruction. Past medical history included multiple reconstructive surgeries and a prior history of difficult intubation. No other comorbidities were identified. On physical examination, predominant clinical features included severe mandibular hypoplasia. Mallampati score was class IV. An anticipated difficult airway was expected and preparations made accordingly. The chosen approach was an oral awake fiberoptic intubation (FOI) using a flexible bronchoscope, performed under sedation with airway topicalization with lidocaine spray, and maintaining spontaneous breathing. Additional airway and emergency equipment were available. Adequate preoxygenation was performed and supplemental oxygen was delivered via nasal cannula during intubation. FOI was successful on the second attempt. Anesthesia maintenance was achieved with sevoflurane. Surgery was uneventful, extubation was performed in the operating room without any complications and the patient discharged home the next day.

Discussion: This case highlights the complexities of anesthetic management of GS patients. The patient's previous history of difficult intubation and difficult airway predictors prompted meticulous planning. Opting for an oral awake FOI was a strategic choice, with adequate preoxygenation and continuous delivery of supplemental oxygen being crucial steps in maintaining oxygen saturation levels. Despite the challenges, the team's preparation allowed for successful intubation without adverse events and a smooth extubation without complications, reflecting the comprehensive planning and execution of the anesthetic strategy.

Reference:

1. Cakmakkaya, O.S. & Kolodzie, K. (2023). Anaesthesia recommendations for Goldenhar syndrome. Anästh Intensivmed, 64:S27-S38.

Learning Points: This case underscores the importance of tailored approaches in managing patients with complex craniofacial anomalies such as GS. Adequate preoperative assessment, planning, and use of awake FOI were pivotal in ensuring a safe and successful outcome.

42AP06-4

A novel approach combining an old technique to achieve one lung ventilation in pediatric patient

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Background: Achieving one lung ventilation(OLV) is vital for thoracic surgery, however double lumen tube placement(DLT) is not always feasible in young pediatric patients and bronchial blocker(BB) placement can be challenging due to difficulty in guiding distal airway trajectory assuring proper BB placement. We describe BB placement with External Tracheal Manipulation Maneuver(ETMM)1 prior to intubation with endotracheal tube(ETT), thereafter, confirming correct placement with fiberoptic bronchoscopy(FOB).

Case Report: 6 yo male hx of osteosarcoma presented for wedge resection of left upper lobe. Given the patient's size a BB was selected for OLV in lieu of DLT. However, BB(Arndt 5Fr) was placed prior to ETT placement via laryngoscopy and advanced to left mainstem bronchus utilizing ETMM, whereby the trachea is displaced to the right side externally while simultaneously advancing the BB. Airway then secured with 5.5MM cuffed ETT, correct placement of BB in left mainstem bronchus confirmed with 3.0mm pedi-FOB. Minor adjustments in depth of BB position could be done in controlled fashion without interference by BB as it was outside ETT, allowing FOB to move freely in small ETT. OLV achieved without issue, and no static or dynamic airway pressure perturbations were noted; at end of surgery, patient was extubated without any complications.

Discussion: Comparatively pediatric OLV can be more challenging due to physiological, anatomical differences, various pathologies, and size limitations of lung isolation devices. FOB can be onerous due to restricted tube sizes through which BB and scopes can appropriately fit, while providing adequate oxygenation and ventilation. Moreover, achieving OLV without traumatizing the pediatric airway, avoiding excessive airway pressures when devices are sharing the ETT such as FOB and BB is ideal. BB placement using ETMM followed by ETT placement is a useful technique as the FOB is given maximum room to maneuver in a secured airway via ETT to allow confirmation of correct placement. Moreover, since with this technique the BB is outside the ETT and once FOB is removed, maximum ETT diameter is available for ventilation, thus reducing airway pressures.

Reference:

1. JCardiothorac Vasc Anesth 2016 Aug;30(4):1061-3

Learning points: BB placement with ETMM can provide ideal OLV in pediatric patients, facilitating surgery potentially avoiding trauma with larger DLTs while affording maximum ETT diameter possibly reducing barotrauma.

42AP06-5

Case report: Difficult airway management in patient with submandibular adenocarcinoma

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Background: Patients with submandibular gland malignancies often present with either a slow or rapidly growing mass in the submandibular triangle of the neck, with or without pain. In this study. We reported a case of adenocarcinoma of the submandibular gland presenting with the upper-airway obstruction, which necessitated emergency tracheostomy.

Case Report: A 44-year-old male patient was referred from the Medical Oncology Clinic to the Otolaryngology Clinic due to increasing swelling in his neck with a 1 year progressive, painless submandibular swelling, which worsened. There was associated dysphagia to solid, muffled voice, weight loss, and features of upper-airway obstruction.

The physical examination showed a chronically ill middle-aged man in obvious respiratory distress. The neck examination revealed a huge left submandibular swelling that crossed the midline (110x10 cm).

We were concerned about impossible direct laryngoscopy because the massive tumor in the floor of the mouth compressed the base of the tongue against the posterior wall of the pharynx, restricting the space for inserting the laryngoscope blade. Therefore, we planned to perform awake nasal fiberoptic intubation to secure the airway.

Although the procedure was complicated by the massive tumor, successful intubation was achieved



Discussion: In cases of predicted or known difficult laryngoscopy, the FOB is ideal for navigating the airway and bypassing oropharyngeal lesions due to the insertion cord's thin diameter and high manoeuvrability.

References:

Cheng, T., Wang, L., Wang, H., Yang, X., Zhang, X., & Liang, J. (2020). Shikani optical stylet for awake nasal intubation in patients undergoing head and neck surgery. The Laryngoscope, 131(2), 319-325. https://doi. org/10.1002/lary.2876.

Arne J, Descoins P, Fusciardi J, Ingrand P, Ferrier B, Boudigues D, Aries J. Preoperative assessment for difficult intubation in general and ENT surgery: predictive value of a clinical multivariate risk index.

Learning points:

Awake fiberoptic nasotracheal intubation, along with airway blocks and appropriate sedation, can be a viable option in patients with submandibular gland malignancies

42AP06-7

Comparison of clinical performance and complications of I-gel, Classic, and ProSeal laryngeal mask airways in endobronchial ultrasound-guided tracheobronchial needle aspiration

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Background and Goal of Study: This study compared the Classic, Proseal laryngeal mask airways (LMA) and I-gel, in patients undergoing endobronchial ultrasound-guided tracheobronchial needle aspiration (EBUS-TBNA) for clinical performance and complications.

Materials and Methods: Patients (n:183) undergoing EBUS-TBNA were assigned to Classic LMA, Proseal LMA and I-gel groups for airway management. Predictors of difficult airway, ease of insertion of the supraglottic airway devices (SAD), airway pressures, ease of fiberoptic scope (FO) advancement and complication rate were assessed

Results and Discussion: Groups were similar regarding patient characteristics and difficult airway predictors. More patients in the Classic LMA group needed airway opening maneuver (36.1%) for SAD insertion than the Proseal LMA (4.9%) and I-gel (16.4%) groups (p<0.001). Difficult glottis visualisation with FO was higher in Group Classic LMA (45.9%) than the Proseal LMA (13.1%) and I-gel (14.8%) groups (p<0.001). Very difficult FO insertion through the glottis was higher in Group Classic LMA (31.1%) than in the Proseal LMA (4.9%) and I-gel (4.9%) groups (p<0.001). Oropharyngeal leak pressure after insertion of SAD was lower in Group Classic LMA (24.48 mmHg) than Proseal LMA (27.25 mmHg) and the I-gel (27.05 mmHg) groups (p<0.001). The mean FO advancement attempt in Group Proseal LMA (1.34± 0.75) and I-gel (1.38±0.9) was lower than in Group Classic LMA (2.46±1.88) (p<0.001). The mean insertion time in Group I-gel (27.36±17.64 sec) was longer than in Group Classic LMA (20.18±13.24 sec) (p:0.029). The rate of minor dental, lip, and tongue injury, hiccups, laryngospasm, sore throat, and blood stain on SAD were similar between groups.

Conclusion(s): In EBUS-TBNA procedures under general anesthesia, glottis visualisation is limited with the use of Classic LMA compared to Proseal LMA and I-gel, FO passage through the vo-

cal cords requires more attempts and despite a better glottic seal, operators report that the procedure is more difficult with Classic LMA.

References:

Zamparelli, E., et al., LMA® Protector™ versus traditional LMA to perform endobronchial ultrasound-guided transbronchial needle aspiration: a retrospective analysis. Minerva Anestesiologica, 2019.

Bergbower, E.A.S., et al., A Retrospective Analysis of Respiratory Complications under General Anesthesia during EBUS-TBNA. J Community Hosp Intern Med Perspect, 2022.

42AP06-9

Mastering airway challenges: a critical case of emergency tracheostomy in a patient with laryngeal obstruction

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Background: Difficult airway management presents significant challenges in anesthetic practice, particularly in patients with complex anatomical or pathological conditions.^{1,2}

This case ocuses on a 64-year-old female patient with a history of laryngeal chondrosarcoma, presenting with respiratory distress and stridor.

Case Report: The patient was admitted to the ER exhibiting severe dyspnea and stridor. A prior CT scan revealed a laryngeal expansive lesion, compromising her airway.

Given the patient's condition, a meticulous preoperative plan was devised, for a careful airway assessment and management strategy. Awake intubation was attempted using fiberoptic bronchoscopy by the most experienced doctor, but the procedure was unsuccessful due to significant airway obstruction.

Consequently, an urgent tracheostomy was performed by the ENT team under local anesthesia and sedation using ketamine and midazolam. The procedure was completed swiftly and without complications, effectively securing the airway.

Discussion: This case underscores the complexity of managing patients with difficult airways, particularly in the context of malignancies that distort normal anatomy. ^{1,2} Awake intubation remains a preferred technique however, its success is contingent upon various factors, including the degree of airway obstruction and the operator's experience. The rapid conversion to tracheostomy highlights the importance of preparation and adaptability in emergency airway management. The use of local anesthesia and sedation can facilitate airway interventions while minimizing patient discomfort.

References:

1. Hohn A, Kauliņš T, Hinkelbein J, et al. Awake tracheotomy in a patient with stridor and dyspnoea caused by a sizeable malignant thyroid tumor: a case report and short review of the literature. Clin Case Rep. 2017 Oct 5;5(11):1891-1895; 2. Fusco P, Iuorio A, Della Valle M, Ferraro F. Awake tracheostomy in a patient with acute upper airway obstruction: an emergency application of an elective percutaneous procedure. Open Access Emerg Med. 2019;11:167-170.

Learning points: This case illustrates the critical aspects of managing difficult airways, including the necessity for thorough preoperative planning, the value of experienced personnel, and the readiness to perform emergency procedures such as tracheostomy. Effective communication and collaboration between specialties are essential in optimizing patient outcomes in challenging airway scenarios.

42AP06-10 Take my breath away

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Background: Approaching a difficult airway is a challenge inherent to the practice of anesthesiology, becoming particularly complex in an emergent context, especially while practicing in a peripheral hospital.

Case Report: Male, 56 years old, ASA score IIE, admitted to the emergency department of a peripheral hospital due to an acute peritonsillar abscess. The anesthesiology team was requested, having verified a conscious and cooperative patient, presenting with sialorrhea, dyspnea and dysphagia. Airway evaluation showed a mouth opening of 4 cm, Mallampati score IV and bulging of left parapharyngeal region. The absence of night ENT emergency service forced the patient to be transferred to a tertiary hospital, but first it was mandatory to ensure airway patency. Awake traqueal intubation (ATI) was performed. The process was explained to the patient and alternative plans were considered, such as fibroscopy and marking of cricothyroid membrane. Preoxygenation, topicalisation with lidocaine with head elevation and sedation with midazolam and dexmedetomidine were performed, followed by videolaryngoscopy with hyperangulated blade, which was successful on first attempt, but required aspiration of secretions. After confirmation of correct tube placement, anesthetic induction was performed.

Discussion: ATI is the technique of choice in predicted difficult airway. Multiple factors increase its success rate, such as supplemental oxygen, spontaneous ventilation, conscious sedation, patient cooperation and topical anesthesia. The performance of this technique in a peripheral hospital can be a rare event, causing anesthesiologists to have lesser contact and these skills may be lost over time. As the anesthesiologist is the airway expert, strengthening emergency teams with anesthesiologists becomes a priority, such as the adequate training of professionals in ATI. The availability of equipment for this practice is important, thus prior planning and adequate budgeting is mandatory.

References:

1. Ahmad et al, Difficult Airway Society guidelines for awake tracheal intubation (ATI) in adults. Anaesthesia 2020; (2) Myatra et al, Optimizing education in difficult airway management: meeting the challenge. Ambulatory anesthesia 2017

Learning points: Strengthening emergency teams with anesthesiologists trained in difficult airway management and supporting them in acquiring these skills; reinforce peripheral hospitals with the necessary equipment; ensure alternative plans.

42AP06-11

Qualitative assessment of possible pain and discomfort in awake biphasic cuirass ventilated patients: a prospective observational study

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Background and Goal of Study: Modern Extra-thoracic biphasic Cuirass Ventilation has recently been established for airway surgery with unlimited access to the airway.^{1,2} Before surgery, a frequent question from patients is if cuirass ventilation is associated with pain or discomfort, however, no study has described this. This study evaluated if awake cuirass ventilation is associated with pain or discomfort. This knowledge is required to give patients correct and appropriate pre-procedural information, or premedication, before initiating cuirass ventilation.

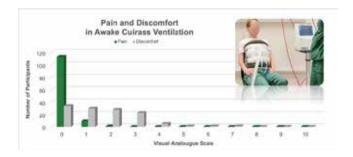
Materials and Methods: Healthy volunteers had awake cuirass ventilation.2 Following Ethics Committee approval participants gave written and oral consent and evaluated the level of possible pain or discomfort on a visual analogue scale from 0-10 where 0 represented no pain or discomfort, respectively and 10 represented worst imaginable pain or discomfort, respectively. Moreover, all participants rated their subjective perception of how effective the cuirass ventilation supported their ventilation with statements of no support =1, partly support =2 and cuirass overtook my ventilation =3. Results are presented as mean± standard deviation.

Results and Discussion: Participants where 43±8 years old. weighed 74±15 kg and were 174±10 cm tall. Sixty-seven identified as women and 56 as men. Ninety-two percent experienced no pain and 10 experienced very little pain i.e., VAS < 3 during cuirass ventilation with a mean VAS score of 0.1±0.3. Cuirass ventilation was generally not uncomfortable, with an overall VAS score of 1.6±1.4 and with only 7 out of 123 participants (6%), scoring above VAS 3. The subjective perception of ventilation support from cuirass ventilation was reported as full ventilation in 46%, partly ventilation in 50% and 4% did not feel any effect.

Conclusion(s): Awake cuirass ventilation is not painful, rarely uncomfortable, and supports ventilation in most awake patients. These results can be used to inform patients when using cuirass awake, or before airway surgery with cuirass ventilation, and to plan and choose ventilatory support.

References:

1. PMID: 37587006 2. PMID: 37718095



42AP06-12

Anesthetic approach with neuromonitoring tube and endobronchial blocker in uniportal VATS surgery

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Background: The resection of mediastinal lesions closely associated with the recurrent laryngeal nerve (RLN) requires intraoperative neuromonitoring (IONM) to prevent nerve damage. In thoracic surgeries, one lung ventilation (OLV) is conventionally achieved with a double-lumen tube (DLT)(1), however, the need for IONM creates a challenge in airway management. This case demonstrates an alternative approach combining a neuromonitoring electromyography endotracheal (EMG-ET) tube with an endobronchial blocker EZ Blocker in a non curarized patient to meet both surgical and anesthetic demands, ensuring patient safety.

Case Report: A 50-year-old female patient with a mediastinal cystic lesion, otherwise healthy, was scheduled for resection via uniportal left video-assisted thoracoscopic surgery (VATS). Due to the lesion's intimate contact with the left RL and the need for IONM, a EMG-ET tube was used instead of the DLT as per institutional practice. Following anesthetic induction, a EMG-ET tube was successfully placed and alignment confirmed via videolaryngoscopy. To achieve OLV, an EZ-Blocker was placed under direct bronchoscopic guidance, ensuring proper cuff inflation and effective lung isolation. Before surgical incision, the neuromuscular blockade was reversed with sugammadex. The surgery proceeded uneventfully, and the patient was extubated at the end of the procedure without complications.

Discussion: This case highlights an effective alternative for lung isolation during VATs when RLN monitoring is essential. The substitution of the DLT with a neuromonitoring tube combined with an EZ-Blocker and the absence of curarization met the surgical and anesthetic requirements while maintaining airway safety. Previous studies suggest that endobronchial blockers are a safe and efficient solution in situations where DLTs are less suitable(2). This case underscores the importance of tailored, evidence-based approaches to challenging clinical scenarios.

Reference:

1. DOI: 10.1016/1053-0770(92)90056-d; 2. DOI: 10.1186/s13019-018-0767-9.

Learning points: Combining a neuromonitoring endotraqueal tube with an endobronchial blocker is a safe and effective alternative to DLTs in VATs procedures requiring RLN monitoring. Avoiding neuromuscular blockade enables optimal conditions for IONM, while careful airway management ensures patient safety and surgical success.

42AP07-1

An unexpected subglottic clot: a case of an unpredictable difficult airway

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Background: Tracheostomy is a frequently necessary procedure in patients who require prolonged ventilatory support. There complications, such as local bleeding, which sometimes require surgical revision or even replacement of the cannula in the operating room. Airway management in these cases can be challenging. Case Report: We report a case of a 51-year-old man with a persistent tracheostomy bleeding. The patient had been admitted to the Intensive Care Unit 10 days previously following a haemorrhagic stroke, which required a tracheostomy due to his altered mental status and subsequent need of airway protection. For the tracheostomy surgical revision the surgeons needed to extract the cannula, so it was crucial to secure the airway with an endotracheal tube (ETT). The patient was admitted to the operating room, sedated and connected to a ventilator through the tracheostomy cannula. The anaesthetic team decided to intubate via fibreoptic bronchoscopy, which revealed a massive clot in a subglottic position (above the tracheostomy cannula), occupying the entire tracheal lumen, making it impossible to pass the ETT. The team immediately reported the finding and placed a Frova introducer connected to an oxygen source through the cannula to ensure not to lose access to the airway. The surgical team externalized the cannula to access the clot and remove it through the tracheostoma. As the clot was being removed the ETT was advanced. Only after confirming the correct placement of the ETT, the Frova was removed.

Discussion: In this case, the anaesthetic team decided to use fibreoptic bronchoscopy for intubation, considering the risk of losing access to the airway. This proved to be a wise approach, as intubation using either direct or videolaryngoscopy would likely result in dislodgment of the clot into the lower airways, posing a risk of obstruction and potentially catastrophic consequences. It was also decided to use a Frova as a backup, providing a secondary route to the airway. This not only serves as a guide for a potential new cannula but also allows for oxygenation during the procedure.

Reference:

Hyzy, R.C. (2023) Tracheostomy: Postoperative care, maintenance, and complications in adults, UpToDate.

Learning points: This case highlights the importance of considering the intubation technique for tracheostomy revision. It is of paramount importance to consider fibreoptic bronchoscopy for intubation in patients with persistent tracheostomy bleeding.

42AP07-2

Does growth hormone cause obstructive sleep apnea and expected difficult airway without facial feature changes in patients with growth hormone secretory pituitary adenoma?

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Background: Obstructive sleep apnea (OSA) secondary to upper airway obstruction can affect up to 70% of acromegalic patients who are manifested by enlarged hands, feet and hypertrophy of the facial bones, especially the mandible. (1) Soft tissues of the nose, mouth, tongue, lips, laryngeal and pharyngeal soft tissues leading to a reduction in the size of the glottic opening, hypertrophy of the peri epiglottic folds, and calcinosis of the larvnx can all contribute to airway obstruction and respiratory disease.

Case Report: male patient aged 43 y old, BMI 40, achieved 4 criteria of STOP_BANG score . Medical history of hypothyroidism and gynecomastia. Surgical history of diagnostic upper GIT endoscope due to gastritis.

Vital data: normal, Air way: Mallampati II. Investigation: Euthyroid, prolactin level (high), IGF-1 400 ng/ml (high level). ECG: normal sinus rhythm.

Intraoperative: patients f monitored by 5 ASA monitoring, invasive arterial blood pressure monitoring and CVP . Preoxygenation for 3 minutes, anesthesia given we used c-mac for intubation, and we found that hypertrophy kissing tonsils and peri epiglottic folds, Cormack-Lehane Grade III, c-mac changed to D-mac and one trial taken, using armored tube size 7.5 cuffed, we used fiberoptic but there difficulty because the oozing which occurred from these hypertrophied fragile tonsillar tissue ,fiberoptic trial failed so we prepared set of percutaneous tracheostomy ready to protect the airway, we made a last attempt using D-mac and intubation done. we used fiberoptic to confirm the tube site and patency.

Armored metallic tube to regular one and shifted intubated after discussion with surgeons and family, stable hemodynamics to ICU.



Discussion: According to our study and the previous studies made, GH may affect only the airway without other features which appear in patients with acromegaly

References:

Pazarlı AC, Köseoğlu Hİ, Kutlutürk F, Gökçe E. Association of Acromegaly and Central Sleep Apnea Syndrome, Turkish Thoracic Journal, 2017 Nov 29:20(2):157-159.

Learning points: ENT consultation must be routine before surgeries in cases with high growth hormone level even without presence of acromegaly.

42AP07-4

Postoperative controlled ventilation in a patient with Montgomery's T-Tube in situ following laryngotracheal reconstruction

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Background: The Montgomery T-tube(MTT) poses many anaesthetic challenges, particularly with respect to the delivery of volatile agents and controlled ventilation. The Montgomery tube has the disadvantage of not having a suitable adaptor for standard catheter connector. There may be difficulty in maintaining controlled ventilation as the upper end of the intratracheal position of tube has to be occluded to prevent loss of inspired gas.

Case Report: A 75year old female with morbid obesity was admitted for laryngotracheal reconstruction, patient had a size 6 tracheostomy tube in situ. She required BIPAP support preoperatively. Surgeon planned to use MTT of size 14mm external diameter as tracheal stent. We established that the intratracheal lumen would allow the easy passage of a Portex tracheal tube (cuff removed) with a maximum ID of 6.5mm (ED 8.2 mm) prior to surgery. During surgery, once the MTT was placed, 6.5mm ID tracheal tube was inserted bougie aided under the guidance of video laryngoscope into the intratracheal lumen. The ET tube was fitting the MTT, the surgeon guided the ET tube and placed the tip of the tube proximal to the junction of T-tube. The extratracheal lumen was occluded and patient was mechanically ventilated for 24 h through the oral endotracheal tube. Patient was extubated after 24 hours with the surgeon holding the T-tube in place.

Discussion: Controlled ventilation through a MTT poses unique challenges due to leak from proximal end of the tube. There is insufficient literature regarding mechanical ventilation in patients with MTT in situ. Orotracheal intubation guided by videolaryngoscope with a bougie passing through the MTT proves to be practicable

References:

The Montgomery T-tube: anaesthetic problems and solutions BJA volume 87, issue5,p787-790November 2001

Montgomery T-tube: anesthetic management, Journal of clinical anaesthesia 2007: 19 p135 -137

New approach to anaesthetizing a patient at risk of pulmonary aspiration with a Montgomery T-tube in situ :BJAvolume101,issue3,September 2008

Learning points: Controlled ventilation in a patient with MTT insitu can be achieved by orotracheal intubation.

Tea trolley training: a way of training your airway skills during your regular day shift

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Background and Goal of Study: The "Tea trolley training" is a learning method that originated at the Royal United Hospital in Bath. It arose from the interest in promoting the acquisition of knowledge during working hours while also providing a reward for the learner (1). The practice of technical skills through simulation systems enables greater integration of the knowledge acquired (2).

Materials and Methods: The method was used to train the SART-DP in airway management skills, with two instructors from GVAP, a simulation station with a model for intubation using an optical bronchoscope, and another with the ORSIM simulator. These devices were placed on a trolley, which also contained coffee and pastries at the bottom.

One of the instructors would take over the operating room, allowing the anesthesiologist to step out and participate in a learning session lasting between 10 and 15 minutes. The instructor would advise and guide the learner in solving cases. This was followed by a small reward in the form of a snack. Anonymous questionnaires were then distributed to assess the utility and satisfaction of the participants. Out of the 25 participants, 18 completed the questionnaire.

Results and Discussion: Responses were collected from 18 members of the SARTDP. 94.4% found this activity useful. They rated it 9.17 (out of 10) for whether participating in this experience could improve behaviors useful in a real-life case, and the same score for whether it helped them maintain technical skills with the devices. Satisfaction was rated 9.39, and conducting the training during working hours received a score of 8.44. The role of the instructor was rated 9.83, and the materials used were rated 9.44. Conclusion(s): Tea Trolley Training is an easy-to-implement learning method with a high degree of satisfaction among participants. It allows for widespread dissemination within the target population as it takes place during working hours, and promotes team building.

References:

- 1. Corbett L, Davies A, McDonald M, Kelly F, Jordan L (2020). 'Bath Tea Trolley' Training; Part 1. Royal College of Anaesthetists Bulletin; 119; 28-30
- 2. Association for Experimental Education. What is experiential education? 2022. Available at: https://www.aee.org/what-is-experiential-education.

42AP07-6 An almost impossible airway in a massive goitre

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Background: Massive goitre, with compression of adjacent airway structures, is an anaesthetic challenge.

Awake Fibreoptic Intubation (AFI) is the preferred technique for managing an anticipated difficult airway (DA).¹

Case Report: A 52-year-old male with mild heart failure, sleep apnoea, hyperthyroidism and metabolic syndrome presented for total thyroidectomy due to massive goitre. He had symptoms of dyspnoea. CT scan revealed probability of difficulty in airway approach. Nasopharyngoscopy showed total airway obstruction in resting state.

In the operating room, the patient was semi-recumbent with standard ASA and invasive blood pressure monitoring. AFI conditions were guaranteed. Initial intubation attempts by mouth and nose, with Flexible Fibreoptic Bronchoscopy (FFB), failed due to anatomical distortion.



A combined technique using videolaryngoscopy (VL) and nasal FFB was employed. The use of VL lifted the soft tissues and helped defining the correct pathway. On the second attempt, a 7.0 mm endotracheal tube was successfully positioned above the carina, and induction of anaesthesia carried out.

Three experienced pneumologists attempted multiple intubations. The entire process lasted for 90 minutes.

Surgery proceeded without major complications under balanced general anaesthesia. Postoperatively, extubation was not attempted and the patient was transferred to the ICU sedated and ventilated.

Discussion: Managing the airway in massive goitres is challenging due to anatomical distortions and in our case the impossibility of tracheostomy. This case highlights the importance of hybrid techniques, present in the ASA DA algorithm.²

Multidisciplinary collaboration, leadership and patience were crucial for the positive outcome, emphasising their importance in highly stressful situations.

References:

1. BJA Education, 2022, Volume 22, 298-305.

2. Anesthesiology 2022: 136:31-81.

Learning points:

Multidisciplinary preoperative planning, control of the situation while thinking in alternative solutions, is critical in DA management. The simultaneous use of VL and FFB can surpass some challenges and should be considered in similar scenarios.

42AP07-7

Subglotic stenosis: dilation with the new "Trachealator" device. a case report

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Background: Subglottic stenosis is the pathological narrowing of the airway between the vocal cords and the trachea. It can be of congenital origin (10%) or acquired (90%).

The main symptom is stridor, mainly biphasic, both during inspiration and expiration. When we talk about treatment, we will have non-surgical treatments and invasive treatments, among which is endoscopic dilation using an adapted balloon. The main drawback of this intervention is the impossibility of ventilating the patient during dilation.

With new technologies, new devices have been designed to alleviate this problem, among which we find the "Trachealator".

The "Trachealator" is a non-occlusive balloon dilatation for the airway made up of small balloons, which allow the dilation of the trachea while keeping the airway permeable at all times, allowing ventilation.

Case Report: A 64-year-old woman diagnosed with subglottic stenosis. Endoscopic treatment using the "Trachealator" device is decided upon. Anesthetic induction is performed without incident and a No. 4 ambu laryngeal mask is placed. The "Trachealator" device and a FBC are introduced through it for verification. Dilation is performed, maintaining ventilation.

Discussion: Regarding anesthetic management, some difficulties were encountered. The use of the "Trachealator" requires a specific adapter that allows simultaneous introduction of the balloon and the FBC through the laryngeal mask. During the procedure, when using the Aisys2 respirator, equipped with a concertinadriven mechanism, leaks were observed through the adapter that were not adequately compensated.

In conclusion, it would be advisable to design an adapter that minimizes leaks and allows optimal ventilation.

References:

ALVO V. Andrés et al. Dilatación precoz de estenosis subglótica adquirida posintubación utilizando tubos endotraqueales. Rev. Otorrinolaringol. Cir. Cabeza Cuello [online]. 2019, vol.79, n.3 [citado 2024-12-05], pp.271-278.

Jagpal N, Sommerfeldt J, Shabbir N. Estenosis subglótica. [Actualizado el 30 de octubre de 2023]. En: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024

Wijermars LGM, Hoekstra CEL, Nguyen TTT, Stevens MF, Dikkers FG. New Treatment Strategy for Subglottic Stenosis Using the Trachealator, a Novel Non-occlusive Balloon.

Laryngoscope. 2022 Nov;132(11):2202-2205. doi: 10.1002/ lary.30234. Epub 2022 May 30. PMID: 35634800; PMCID: PMC9796555.

Learning points: Subglottic stenosis, new treatments and devices

42AP07-8

Perioperative management of a patient with Type 1 Hereditary Angioedema for urgent surgery

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Background: Hereditary Angioedema (HAE) is a rare, autosomal dominant disorder characterized by recurrent episodes of angioedema. The most common forms are caused by deficiency or dysfunction in C1 inhibitor. Triggers for acute attacks are common in the perioperative period namely some drugs, orotracheal intubation and others.

Case report: A 20-year-old man, ASA-PS II, with HAE type I, presented with a laceration of the 2nd and 3rd fingers of the right hand with tendinous section of the extensors. The patient was first diagnosed with HAE at the age of six, with recurring symptoms through is life and over the last year, an increased recurrence with three acute attacks that required emergency services. C1 inhibitor concentrate were administered. 1h before the procedure. After premedication with midazolam, an ultrasound and nerve-stimulator-guided axillary brachial plexus block was performed with ropivacaine 0,75%, 20ml. The procedure took less than 1h and after recovery in the Post-Anesthesia Care Unit the patient was transferred to a level 2 ICU where he remained uneventful for 24h.

Discussion: The rarity of HAE makes it challenging to Anesthesiologist and a careful perioperative planning is fundamental. Although there are no guidelines regarding perioperative management, prophylaxis with C1-INH is recommended to prevent acute attacks as is regional anesthesia. Other therapeutic options include starting or increasing doses of androgens or administration of fresh frozen plasma.

This case highlights keys aspects of HAE management for sur-

- the prophylactic use of C1 inhibitor and its availability during and after surgery;
- the avoidance or airway handling, as acute airway edema can be life-threatening, but as it can always supervene it's crucial to closely monitor and have equipment ready to secure the airway;
- the assurance of ICU monitoring for at least 24h with readily available C1 inhibitor

Additionally, education of patient on how to manage or seek care if an attack occurs after discharge is of paramount value.

Reference:

Rodrigues, C., et all (2018) Journal of the Portuguese Society of Anesthesiology, 27(1), 70-77 Conceição, L., et all (2014). Journal of the Portuguese Society of Anesthesiology, 22(1), 20-23

Learning Points: Increasing awareness of prophylaxis will allow providers to develop an perioperative plan; Preference for regional anesthesia to avoid airway handling; Careful observation after surgery to detect delayed manifestations

Transfixing haematoma after anterior cervical arthrodesis surgery

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Background:Transfixing haematoma after anterior cervical surgery has an incidence of around 0.2-1.9%¹. Most events occur within 48 hours after surgery, reintubation is frequently required and deaths due to airway obstruction have been described.

Case report:A 76-year old man was admitted for discectomy and anterior cervical arthrodesis C3-C5. Seven hours after surgery, the patient had dyspnoea, difficulty breathing and stridor. A CT scan showed obstructive symptoms, as well as cervical haematoma with active bleeding and tracheal obstruction. Otorhinolaryngology was notified due to the possibility of requiring an emergency tracheostomy. The surgical staples were removed, 100% oxygen and 1 mg of midazolam were administered. Awake fibreoptic (FO) intubation was attempted, but without success. Therefore, a tracheostomy was performed, while the haematoma was evacuated. The patient was discharged after 24 hours in intensive care.

Discussion:ThThe possible mechanisms by which a haematoma can produce airway compromise are direct mechanical compression and airway oedema. Clinical findings are variable, from difficulty talking and breathing in the early stages, to dyspnoea, inspiratory stridor and cyanosis, with potential progression to respiratory failure. The primary objective is to establish patency of the airway by intubation (direct laryngoscopy, FO or surgical means). General guidelines include bringing the patient to the operating theatre, administering 100% oxygen and minimising the use of sedatives.

Awake FO intubation or direct laryngoscopy technique should be attempted. If the intubation fails, a haematoma evacuation is recommended, and an additional attempt at intubation is performed. Finally, if these measures fail, a surgical airway will need to be established either by cricothyroidotomy or surgical airway by a specialist.

Reference:

1.Palumbo MA et al.Airway compromise due to wound hematoma following anterior cervical spine surgery.Open Orthop J.2012;6:108-13.

Learning points: Transfixing haematoma is a potentially lethal complication associated with anterior cervical spine surgery. Early recognition and isolation of the airway is essential.





42AP07-10

The use of VivaSight Single Lumen with a enbronchial blocker in MIDCAB surgery – a feasibility study

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Background and Goal of Study: The VivaSight Single Lumen is a single-use endotracheal tube with an integrated camera for continuous airway visualization on the attached monitor. In this pilot study, we evaluated the feasibility of its use for intubation and endobronchial blocker placement in patients undergoing minimally invasive direct coronary artery bypass (MIDCAB) surgery.

Materials and Methods: Data from 32 patients scheduled for elective MIDCAB surgery between 2021 and 2024 were retrospectively analyzed. Airway management was performed using the VivaSight Single Lumen tube and an endobronchial blocker by 10 anesthesiologists of varying seniority. Outcomes included insertion success rate, quality of lung separation, surgical conditions, and respiratory complications. Ease of use and satisfaction were assessed via a questionnaire.

Results and Discussion: The VivaSight Single Lumen tube was successfully placed using direct laryngoscopy in 31 patients (96.9%). One failure (3.13%) occurred in a patient with a Cormack-Lehane score III and subglottic stenosis, who was eventually intubated with a fibrescope through an i-gel supraglottic device. The endobronchial blocker was successfully placed using the VivaSight visualization alone in 29 patients (93.5%); 2 cases (6.5%) required additional fiberoptic repositioning of the blocker due to obstructed view by sputum. Adequate lung collapse and optimal surgical conditions were achieved in all cases. No major intraoperative respiratory complications occurred, except for one patient (3.13%) temporarily requiring higher PEEP after resuming two-lung ventilation. Postoperative chest X-rays showed left-sided dystelectasis or atelectasis in 16 patients (50%), however, only 2 patients (6.3%) required CPAP or non-invasive ventilation, and 1 patient (3.13%) had a conservatively managed left-sided pneumothorax unrelated to central venous cannulation.

All 10 anaesthesiologists found the VivaSight Single Lumen tube easy or very easy to use and would prefer it over a standard endotracheal tube with a fiberscope.

Conclusion: Using the VivaSight Single Lumen tube for intubation and endobronchial blocker placement is feasible in MIDCAB surgery patients. A prospective randomized controlled study is planned to investigate this method further.

42AP07-11

Detection of predictors of difficult airway in pre-anesthetic evaluation and their correlation with difficult orotracheal intubation in oncology patients

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Background and Goal of Study: Difficult airway (VAD) is a clinical situation in which a trained physician has difficulty in performing endotracheal intubation, facial mask ventilation, or both. The Pre-Anesthetic Assessment (PAA) is crucial for theanesthetist to detect patients with risk factors for DA. Both the unpredictability linked to the diagnosis and the lack of careful airway assessment compromise the medical approach and contribute for DA being the leading cause of morbidity and mortality related to anesthesia. The aim of this study is to evaluate whether the predictors of difficult airway align with current practice during orotracheal intubation.

Materials and Methods: This study was conducted in an observational, cross-sectional and retrospective manner between January 2023 and December 2023, at a public healthcare hospital for oncological patients in São Paulo, Brazil. Data were collected from patients' electronic medical records: whether they had risk factors for AD identified in the pre-anesthetic evaluation and if they had been described as intubation/difficult airway in the intraoperative anesthetic record. The inclusion criteria were patients who underwent thyroidectomy and hysterectomy between January and December 2023. The exclusion criteria were patients who underwent other surgical procedures or who underwent the procedure outside the defined period. The DA predictors analyzed in the APA included age, sex, Mallampati classification, obesity, increased cervical circumference or retrognathism, and the presence of tumors or abscesses.

Results and Discussion: During the study period, 177 thyroidectomies and 217 hysterectomies were performed. Difficult intubation was described in 13 patients who underwent thyroidectomy (0.73%) and 16 who underwent hysterectomy (0.57%). Despite many patients having at least two predictors of difficulty, DA was identified in only 10 out of 29 reported cases, meaning that approximately 65.5% of DA cases went unrecognized.

Conclusion(s): Although risk factors are incorporated into evaluation scores, no score has yet demonstrated high specificity and sensitivity for diagnosis, making DA identification difficult and prone to error. Therefore, the development of new

tests or scores is essential, as they will enable the progressive integration of DA prediction into daily practice.

42AP07-12

Neonatal airway management in maternal fetal surgery case report

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Background: Maternal-fetal surgery is a multidisciplinary surgery involving obstetrics and paediatric anaesthesia, involving both mother and fetus. In this case report, we aimed to present the surgical management of a fetus with ongoing placental circulation.

Case Report: Spinal anaesthesia was performed in a 29-week pregnant woman with no known disease. Tracheostomy was prepared for the fetus diagnosed with antenatal oronasal mass. After delivery, the placenta was not clamped and the fetus was placed on the table without separation from the placenta. Tracheostomy was decided for a fetus with a heart rate >100/min, no reflex response and the mass completely filled the oral cavity. Propofol, fentanyl, remifentanil infusion was administered to the mother to prevent maternal awareness and for anaesthesia and analgesia in the fetus. The fetus, whose tracheostomy was opened and separated from the placenta and who was not breathing spontaneously, was connected to a mechanical ventilator. The fetus was operated at the age of 4 days because of a rapidly growing oronasal mass. The mass was reported as an immature teratoma (epignatus).

Discussion: Ex-utero intrapartum (EXIT) procedures are performed close to term to ensure fetal lung maturity. Before the umbilical cord is clamped, the placental circulation continues while the surgical procedure is completed and the fetus is delivered at the end of the procedure. EXIT procedures, uteroplacental flow is maintained and surgery can be performed for 2 hours. (1) Morphine, fentanyl, remifentanil are used for maternal-fetal analgesia and sedation. Even if the fetus cannot perceive pain at the cortical level, it has the ability to receive information from nociceptive stimuli and form a response to pain and shape the development of the nervous system. (2)

This case, we report our experience in the airway management of a fetus with oral teratoma under spinal anaesthesia for maternalfetal surgery.

References:

- 1. Oliveira E, Pereira P, Retroz C, Martires E. Anesthesia for EXIT procedure (Ex utero intrapartum treatment) in congenital cervical malformation-a challenge to the anesthesiologist. Rev Bras Anestesiol 2015 Nov-Dec;65(6):529-33.
- 2. Brusseau R, Mizrahi-Arnaud A. Fetal anesthesia and pain management for intrauterine therapy. Clin Perinatol 2013; 40:429-42.14

Learning points: Mini surgical procedure can be performed on the fetus without separation of the placenta, in which case maternal anesthesia management

42AP08-1

Temporomandibular joint ankylosis in pediatrics: A challenge in airway management

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Background: Intubation in a patient with temporomandibular joint (TMJ) ankylosis is a challenge for the anesthesiologist (1).

Case Report: A 12-year-old male patient proposed for temporomandibular arthroplasty due to TMJ ankylosis associated with mandibular microsomia (Image 1).



Image 1 - Facial dysmorphia with retrognathia

The case was discussed by a multidisciplinary team and the initial plan for approaching the airway was nasotracheal intubation guided by fibroscopy in an awake patient.

A surgical approach to the airway was established as a rescue plan - the cricothyroid membrane was identified.

An additional anesthesiologist was asked to help with the sedation, so that the anesthesiologist who was experienced in performing fiberscopy could concentrate solely on it. The importance of clear, concise and "closed-circuit" communication during the procedure was reinforced.

Sedation was made by one of the anesthesiologists, with ketamine and propofol in small boluses, titrated for loss of consciousness but maintenance of spontaneous ventilation. Fibroscopy was performed by the second anesthesiologist.

During the procedure, there was always effective communication between the whole team, with the main anesthesiologist communicating with the anesthesiologist who was performing the fiberscopy, informing him that spontaneous ventilation was being maintained and that peripheral oxygen saturation was adequate. The rest of the anesthetic-surgical procedure was uneventful.

Discussion: The presence of different anesthesiologists for sedation and for the fiberscopy technique was essential for the fluidity of the procedure. Communication between the two anesthesiologists allowed the second anesthesiologist to perform the technique smoothly and without altering his focus.

References:

1. Anesth Essays Res. 2018 Jan-Mar;12(1):282-284.

Learning points: This case demonstrates the importance of preparation and planning, making the most of the non-technical skills of the whole team when approaching a foreseeable VAD.

42AP08-2

Universal videolaryngoscopy for tracheal intubation in the operating room. The multicentre prospective before after videolar-surgery study protocol

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Background and Goal of Study: Although evidence from various trials has demonstrated the advantages of videolaryngoscopy over direct laryngoscopy for intubation in the operating room, its effectiveness as a universal approach for tracheal intubation in real-world operating room settings remains uncertain.

Materials and Methods: We conducted a prospective, multicenter, quasi-experimental study to evaluate the effectiveness of universal videolaryngoscopy versus direct laryngoscopy for tracheal intubation in real operating room settings. During the non-interventional phase (June-December 2023), 35 anesthesiologists from 8 hospitals performed tracheal intubations for elective or urgent surgeries using the Macintosh direct laryngoscope as the first intubation option. During the interventional phase (March-September 2024), the same anesthesiologists performed tracheal intubations using a videolaryngoscope, which was provided to each of them, as the first intubation option. The primary outcome was the incidence of "easy intubation," defined as successful intubation on the first attempt, easy laryngoscopy (modified Cormack-Lehane grades I-IIa), and no need for adjuvant airway devices during intubation.

Results and Discussion: Among 5132 patients included, easy intubation was achieved in 2216 of 2567 patients (86.3%) during the interventional phase, compared to 1903 of 2568 patients (74.1%) in the non-interventional phase (absolute risk difference: 12.2 percentage points; 95% CI, 10-14; P < 0.001). Successful intubation on the first attempt was higher in the interventional phase (2351/2567; 91.6%) compared to the non-interventional phase (2203/2568; 85.8%; P < 0.001). Difficult laryngoscopy during tracheal intubation occurred in fewer patients during the interventional phase (186/2567; 7.2%) than in the non-interventional phase (441/2568; 17.2%; P < 0.001).

Conclusion(s): Among adult patients undergoing tracheal intubation in a real operating room setting, the use of universal videolaryngoscopy resulted in a higher incidence of patients with easy intubation, higher incidence of successful intubation on the first attempt and lower incidence of difficult laryngoscopy.

42AP08-3

Overcoming airway challenges - Managing a massive cervical lipoma with mediastinal extension via awake fibreoptic intubation

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Background: Managing airways in patients with large compressive masses, particularly those extending into the mediastinum, is challenging due to anatomical and physiological changes. This case describes the anaesthetic approach for a large cervical lipoma with superior mediastinal extension causing substantial airway compression.

Case Report: An 80-year-old male patient, ASA III, presented with a voluminous cervical lipoma extending into the superior mediastinum, which caused rhinolalia but no dyspnoea, orthopnoea, or stridor. Preoperative evaluation highlighted severe pharyngeal airway narrowing and anterior displacement of adjacent structures. Elective excision was planned via cervicotomy with anterior mediastinotomy under general anaesthesia. Intraoperative advanced airway was achieved through awake fibreoptic intubation. The patient was sedated with midazolam (1mg) and dexmedetomidine (1ug/kg/min for 5 minutes, followed by 0,5ug/kg/min). Periglottic lidocaine 1% was administered for topical anaesthesia. A nasotracheal tube (6.5mm, reinforced) was successfully placed on the first attempt. Post-intubation, airway patency and ventilation were ensured throughout. Anaesthesia was maintained with propofol and remifentanil. The tumour was completely excised through cervicotomy, without complications. On the third postoperative day, extubation occurred uneventfully in the ICU. Residual supraglottic oedema was managed with corticosteroids. The patient was discharged one week later. Three weeks after surgery, a follow-up nasopharyngolaryngoscopy showed no abnormalities. **Discussion:** This case underscores the importance of thorough airway management, considering the anatomical and physiological signs of a difficult airway. Awake fibreoptic intubation remains the gold standard for anticipated difficult airways, especially in cases of anatomical distortion and physiological compromise¹. Besides technical expertise, appropriate sedation (to preserve ventilatory drive), and patient collaboration, thorough planning and coordinated care are vital to attaining optimal outcomes2.

References:

- 1. Apfelbaum, J. L. American Society of Anesthesiologists Practice Guidelines for Management of the Difficult Airway (2022).
- 2. Ahmad, I. Difficult Airway Society Guidelines for Awake Tracheal Intubation in Adults (2020).

Learning points: In patients with predicted difficult airway, awake fibreoptic intubation should be considered an effective strategy for airway management.

42AP08-4

Perioperative anesthetic considerations in a patient with acquired tracheoesophageal fistula undergoing laparoscopic intervention: a case report

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Background: Acquired tracheoesophageal fistula (TEF) is a rare pathological connection between the trachea and esophagus, often linked to esophageal malignancy.[1] The establishment of communication from the airway to the upper-gastrointestinal tract poses constant risk of gastric aspiration and implies a tailored airway management based on the fistula's size and location to mitigate complications.[1]

Case Report: This case report details the anesthetic management of a 78-year-old man, ASA IV, receiving palliative care for esophageal adenocarcinoma, two years after undergoing an Ivor-Lewis esophagectomy and chemo-radiotherapy. The patient's condition was further complicated by the development of a TEF, measuring 1.5cm in diameter, located 5cm above the carina, which exacerbated his dysphagia. Due to the failure of an esophageal prosthesis and percutaneous endoscopic jejunostomy, a laparoscopic jejunostomy was proposed. General anesthesia was induced in a semirecumbent position following preoxygenation. Induction involved the intravenous administration of 100ug of fentanyl, 50mg of lidocaine and 50mg of propofol followed immediately by 60mg of rocuronium for a rapid sequence intubation. The patient was intubated with a 7.5 endotracheal tube (ETT) guided with stylet, performed using a C-MAC®videolaryngoscope with a D-Blade. The ETT cuff was insufflated at a deeper tracheal position, with the 25cm mark at the labial commissure. Proper ETT positioning distal to the fistula was confirmed using a flexible-fiberscope, ensuring no bronchial intubation and clear visualization of the carina. Pressure controlled ventilation-volume guaranteed was selected as the ventilatory mode, using low tidal volumes with continuous monitoring of oxygenation and airway pressure. GA was maintained with 1-2% sevoflurane. The surgery lasted 2 hours and was uneventful. At the end, the patient was extubated in a semirecumbent position and admitted in the postanestheticcare-unit for further vigilance.

Discussion: Effective preoperative planning and precise ETT placement ensured a safe and uneventful surgical outcome.

Learning points: This case emphasizes the critical importance of tailored anesthetic and airway management in patients with TEF and highlights the need for a multidisciplinary approach in managing such cases to minimize complications.

Reference:

1. Acquired tracheo-oesophageal fistula in adults. Didee R, Shaw IH. Continuing Education in Anaesthesia Critical Care & Pain.2006

42AP08-5

Pediatric airway management in a child with achondroplasia and extensive submandibular tumor: a successful videolaryngoscopy case

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Pediatric airway management can be challenging, especially in conditions like achondroplasia, a genetic disorder causing dwarfism in the limbs, linked to difficult airway management (1,2).

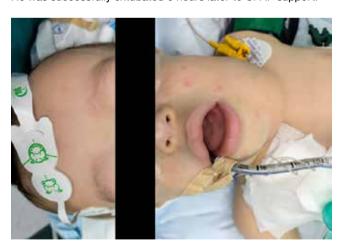
We describe a 2-year-old with fibromatosis, achondroplasia, foramen magnum stenosis and chronic respiratory insufficiency on nocturnal non-invasive ventilation, scheduled for excision of a submandibular tumor.

Preoperative planning involving a maxillofacial surgeon and an experienced anesthesiologist was essential. The patient presented with dysphagia for solids, snoring and progressive upper airway collapse.

Evaluation revealed macroglossia, good mouth opening, unrestricted neck mobility and CT scan with a mass measuring 66x50x75mm causing airway deviation but patent tracheal lumen. We decided for inhalational induction with sevoflurane, intravenous (IV) propofol and remifentanil maintenance and intubation via videolaryngoscopy.

Mask ventilation proved uncomplicated with an oropharyngeal airway. After securing IV access, propofol and remifentanil were administered, followed by rocuronium. Through C-MAC® videolaryngoscope with a pediatric D- blade, a glottic deviation by the mass was visualized, but vocal cords were clear (POGO 100%). A size 4 armored endotracheal tube was successfully placed on the first attempt.

The surgery was uneventful. Transfer to the pediatric intensive care unit was needed due to edema and risk of airway collapse. He was successfully extubated 6 hours later to CPAP support.



This case underscores the importance of thorough preoperative planning, teamwork and communication in managing pediatric airways, particularly in complex cases. Videolaryngoscopy proved effective in securing a challenging airway safely.

1. Disma, Nicola et al. "Airway management in neonates and infants: European Society of Anaesthesiology and Intensive Care and British Journal of Anaesthesia joint guidelines." BJA vol. 132 (2024)

References:

2. Anaesthesia Recommendations for Achondroplasia, www. orphananesthesia.eu/en/rare-diseases/published-guidelines/achondroplasia/671-achondroplasia/file.html
We add to the literature a case of an extensive tumor in a pediatric patient with a challenging airway.

42AP08-6

Perioperative and multidevice approach to the anticipated difficult airway

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Background: anticipated difficult airway is one of the most challenging areas in Anesthesiology. While awake intubation is crucial (1), the management of airway challenges during emergence and extubation remains underemphasized.

Case Report: an 82-year-old male with a history of obesity and valvular heart failure was scheduled for hemithyroidectomy due to a giant right goiter. Preoperative assessment revealed several risk factors for difficult airway, including Mallampati score of 4, upper lip bite test class III, and a short and enlarged neck with a cervical mass deforming airway anatomy and compressive symptoms. Significant left tracheal deviation was noticed in Chest CT. Nasofibrolaryngoscopy was not able to visualize any glottic structure due to compression of the hypopharynx.

The patient was preoxygenated with high flow nasal cannula (HFNC) and the location of the cricothyroid membrane was identified with ultrasound (2). Awake flexible bronchoscopic intubation was then performed and the airway was secured without complications. After the surgery, a staged extubation set was utilized and the patient was successfully extubated to HFNC. He was then transferred to an High Depedency Unit, the extubation set was removed after 24 hours and he was discharged from the hospital one week later.



Discussion: this case report emphasizes the complexity of managing an anticipated difficult airway. While the focus is frequently on awake bronchoscopic intubation, there are several other procedures and devices of uttermost importance to maintain adequate oxygenation, ventilation and airway patency. Respectively,

HFNC is fundamental to maximize safe apnea time; ultrasound identification of the cricothyroid membrane eases progression to rescue airway: and finally, the staged extubation set allows one to secure the airway should any complication arise and reintubation is needed.

References:

1. PMID: 31729018; (2) PMID: 27432055; (3) PMID: 37420175 Learning points: a comprehensive approach that spans the entire perioperative period and implicates mastery of different devices and techniques should be utilized in the management of the anticipated difficult airway.

42AP08-7 Universal use of videolaryngoscopy for double-lumen tubes: Subanalysis of the VIDEOLAR-SURGERY study

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Background and Goal of Study: Tracheal intubation with double-lumen tubes (DLTs) is considered challenging compared to standard endotracheal tubes due to the technical demands and anatomical considerations involved.

Materials and Methods: This is a subanalysis of a large prospective, multicenter, quasi-experimental study performed on 8 spanish hospitals to analyze the effectiveness of universal videolaryngoscopy against direct laryngoscopy for tracheal intubation in a real operating room setting (VIDEOLAR-SURGERY study).

Our primary aim was to compare whether using a videolaryngoscope as the initial device for intubation with a double-lumen tube (DLT) improves the rate of "easy intubation" compared to the Macintosh laryngoscope. Easy intubation was defined as successful intubation on the first attempt, easy laryngoscopy (modified Cormack-Lehane grades I-IIa), and no need for additional airway devices during the procedure.

In the non-interventional phase (June-December 2023), anesthesiologists performed tracheal intubations with DLT for elective or urgent surgical procedures using the standard Macintosh direct laryngoscope as the first intubation option. In the interventional phase (March-September 2024), the same anesthesiologists performed tracheal intubations with DLT using a videolaryngoscope as the first intubation option.

Results and Discussion: Among the 189 patients included, easy intubation was achieved in 73 of 95 patients (76.8%) during the non-interventional phase (phase 1), compared to 86 of 94 patients (91.5%) in the interventional phase (phase 2) (p = 0.005). Additionally, subjective difficulty decreased in the interventional phase, with 8 moderate difficult intubations (8.4%) in phase 1, compared to only 2 (2.1%) in phase 2 (p = 0.048).

Conclusion(s): The McGrath videolaryngoscope, used as the first-choice device for DLT intubation, significantly increased easy intubation rates and reduced moderate complexity perception among anesthesiologists. These findings support its systematic implementation in clinical practice to improve safety and efficiency during tracheal intubation with a DLT.

42AP08-8

Emergent airway management of patients with tracheobronchial stents. A Case Report

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Background: The use of tracheal stents for treating central airway diseases has increased. However, these patients are at high risk for airway obstruction, especially after the procedure. The stents can complicate emergency airway interventions. To ensure patient safety, the medical team must create and communicate a clear plan for managing unexpected airway emergencies (1)

Case Report: An 86-year-old patient with a history of a cervical mass extending into the anterior mediastinum and infiltrating the anterior tracheal wall, underwent rigid bronchoscopy and tracheal stent placement for airway management. The procedure was uneventful. However, in the ICU, the patient developed respiratory distress, oxygen desaturation, and ventilatory failure requiring emergent intubation. During intubation, the tracheal stent was inadvertently dislodged distally. The stent was repositioned under general anesthesia in operating room under direct vision to ensure stent and Endotracheal tube through the stent to prevent airway lesions secondary a stent mobilization and assure the relocation, and the patient was successfully intubated through the stent to maintain adequate oxygenation in the ICU. Two weeks later, as extubation was not feasible, a transbronchial tracheostomy was performed to establish a secure airway



Discussion: Managing the airway in patients with tracheal stents is complex due to anatomical changes and the risk of complications like stent dislodgement or airway collapse. During emergent intubation, strategies must prioritize preventing airway obstruction from stent displacement. Alternative ventilation methods, such as ECMO, supraglottic devices (with spontaneous breathing) and low-frequency jet ventilation. The optimal ventilation strategy should be individualized, taking into account the stent's position and the underlying reason for stenosis (2.3)

References:

- 1.SaudiJAnaesth2018Oct-Dec;12(4):626-628
- 2. ShanghaiChest2022;6:13
- 3. BJAEduc2022 Apr;22(4):160-166

Learning points: The takeaway from this case is that intubation and extubation of a patient with a high-risk airway should not be undertaken unless physicians are fully prepared to manage potential complications.

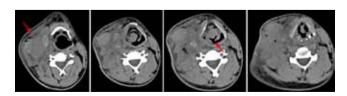
42AP08-9

Emergency front-of-neck access: the need to be prepared

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Background: In an anticipated difficult airway situation (ADA), guidelines suggest the performance of an awake tracheal intubation (1). Still, emergency front-of-neck access (eFONA), a rare but lifesaving procedure, might be needed and the scalpel-bougietube (SBT) is recommended as first-line technique (2). This case presents an eFONA situation in which an alternative to the SBT approach was conducted, highlighting the need for regular training in this technique.

Case Report: Male, 21 years old, ASA-PS IV, hospitalized for a diffuse large B cell lymphoma. Computed tomography of the neck showed multiple right laterocervical adenopathies causing marked deviation of the larynx and trachea towards the left without structural compression. Nasopharyngolaryngoscopy noted a neoformative lesion resting on the glottis with consequent obstruction of the airway but not yet causing respiratory difficulty. The patient was scheduled for surgical tracheostomy in five days but developed stridor and desaturation the next day. An attempt at awake videolaryngoscope-assisted orotracheal intubation was unsuccessful due to immediate active airway hemorrhage once the blade was introduced given the high friability of the glottic lesion. Due to lack of in-person otorhinolaryngology support, an emergent percutaneous cricothyroidotomy was performed with immediate resolution of the stridor and desaturation.



Discussion: In this case of ADA, the choice to maintain spontaneous ventilation was adequate (1). However, given the expected progression of airway compromise, the timing for tracheostomy can be argued on. Also, the SBT technique is the gold standard for

eFONA (2) and, in this case, a percutaneous technique was conducted due to operator's experience, underscoring the need for the anesthetist to be updated and comfortable in performing eFO-NA through regular training, considering its lifesaving nature (2). **References:** 1.

Anesthesiology. 2022; 136:31–81; 2. BJA Education. 2019; 19(8):246-253

Learning points: In an ADA, awake tracheal intubation is advised. eFONA is a rare but lifesaving procedure and the SBT technique is recommended. The anesthetist must undergo regular training in eFONA.

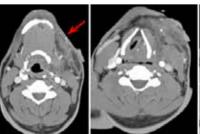
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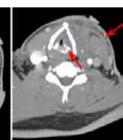
Can't intubate, can't oxygenate: eFONA as a core skill of the anesthetist

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Background: In "can't intubate, can't oxygenate" (CICO) situations, hypoxia is responsible for cardiac arrest and death or brain injury in survivors (1). Emergency front-of-neck access (eFONA) is the final step in rescuing the airway in such scenarios and surgical cricothyrotomy (SC) is recommended over tracheostomy (2). This case presents a CICO situation solved with a tracheostomy approach, noting SC as a core skill of the anesthetist.

Case Report: Male, 39 years old, ASA-PS VE, admitted to the Emergency Room for an anterior penetrating neck trauma after an accident with an angle grinder not affecting large vessels or causing visible active hemorrhage. Upon admission, the patient was alert with a left neck hematoma but no signs of respiratory difficulty and underwent cervical computed tomography. He then developed mild stridor with sudden loss of airway patency. Attempt at videolaryngoscopy-assisted orotracheal intubation under sedation was unsuccessful due to airway distortion. Facemask ventilation was ineffective and consequent severe and prolonged hypoxemia developed. A technically difficult percutaneous tracheostomy was performed, after which cardiorespiratory arrest on pulseless electrical activity developed, with reversal after two cycles of advanced life support. The patient underwent urgent vascular surgery and progressed favorably with preserved cognitive function.





Discussion: In this CICO case, because of operator inexperience in SC, an emergency percutaneous tracheostomy was performed. However, this technique is time-consuming, as seen in the case, and might injure major vascular structures (1), not being recommended as rescue oxygenation in CICO scenarios (2). Therefore, in the emergency setting, SC is a faster and more reli-

able approach to secure the airway (2) and the anesthetist must be ready to execute it.

References:

1. BJA Education. 2019; 19(8):246-253; 2. Trends in Anaesthesia and Critical Care. 2018: 22:45-55

Learning points: Although rare, CICO situations are associated with cardiac arrest and death. eFONA is the final step in airway management in CICO situations so surgical cricothyrotomy presents as a core skill of the anesthetist.

42AP08-11

Airway management in the context of cervical trauma in a pediatric patient

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Background: Cervical trauma often anticipates difficult airway management, as invasive maneuvers may worsen injuries. Laryngotracheal injuries secondary to blunt cervical trauma occur in <1% of all trauma patients. In children, common causes include falls involving hyperextension of the neck, causing compression of the larynx and trachea against the spine.[1]

Case Report: A 35-month-old boy suffered a penetrating-blunt trauma to the anterior neck and was proposed for wound exploration and suturing. Presenting with hoarseness and stridor but no respiratory distress, ENT exam showed mild vocal cord edema and CT showed bilateral subcutaneous emphysema.

Spontaneous ventilation was maintained with boluses of ketamine and dexmedetomidine. Nasofibroscopy was performed post-induction showing no new injuries. The surgery was uneventful, and the patient discharged the following day.

Discussion: This case highlights the importance of considering airway trauma in cervical injuries. Hoarseness and stridor are nonspecific but can point to injury.[2] Subcutaneous emphysema meant possible airway trauma.

Without definitely ruling out laryngotracheal injury, sedoanalgesia allowed for spontaneous ventilation, as advancing a tube into the trachea risked aggravating existing injuries, a false lumen, or turning a partial laryngotracheal injury into a complete transection,[1] The management of airway injuries remains controversial, but endotracheal intubation using a fiberoptic scope or tracheostomy should always be considered as alternatives.[1,2]

Given that this was a minor surgical exploration with an estimated duration under 30 minutes, and considering the possibility of worsening an airway injury with a more invasive approach, this strategy provided an appropiate balance of risks and benefits.

References:

- 1. D. Chatterjee, R. Agarwal, L. Bajaj, S. N. Teng, and J. D. Prager, "Airway management in laryngotracheal injuries from blunt neck trauma in children," Paediatr Anaesth, vol. 26, no. 2, pp. 132-8, Feb 2016, doi: 10.1111/pan.12791.
- 2. M. Carratola and C. K. Hart, "Pediatric tracheal trauma," Semin Pediatr Surg, vol. 30, no. 3, p. 151057, Jun 2021, doi: 10.1016/j. sempedsurg.2021.151057.

Learning points:

Managing airway trauma remains complex, but intubation with fiberoptic scope or tracheostomy should be considered.[1,2] For the short duration of surgery and possible airway injury, this strategy allowed for patent airway and spontaneous breaathing

42AP09-1 The case of the missing airway

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Background: Tracheal esophageal fistulas (TEF) pose many difficulties in anesthesia.1 Planning proper instrumentation of the airway, while preventing aspiration and insufflation of the mediastinum, are among some of these challenges.1 This TEF was challenging to manage because the entire posterior tracheal and anterior esophageal walls were missing.

Case report: A 29-year-old female with lymphoma and TEF during pregnancy presents for repair 6 weeks postpartum. She initially presented at 6 weeks gestation with a large mediastinal mass and underwent tracheal stenting. After treatment she had a 5cm TEF. Airway management included a rapid sequence induction, rigid bronchoscope insertion and jet ventilation. Stent was removed, and an exchange catheter was placed through the scope. The scope was removed over the catheter and an endotracheal tube (ETT) was placed over the catheter. The catheter was removed and fiberoptic visualization confirmed the ETT cuff distal to the TEF. After the airway was opened, ventilation was via cross-table ventilation distally. A loop was tied through the tip of the oral ETT and a clamp placed on the distal end of the loop. The oral ETT was retracted into the proximal airway during crosstable ventilation

After resection and the majority of anastomosis was completed, the oral ETT was guided into the distal airway and the cross-table

Discussion: TEFs can be life threatening due to the risk of aspiration and sepsis. TEFs of this size are rare and require meticulous management with limited information on techniques. Abnormal airway anatomy presents unique challenges in securing and protecting the airway.1,2

References:

- 1. Adate KU, et al. Airway manoeuvres during anaesthetic management of adult acquired tracheo-oesophageal fistula. Airway 2021;4:128-31.
- 2. Bibas BJ, et al. Surgery for intrathoracic tracheoesophageal and bronchoesophageal fistula. Ann Transl Med 2018;6(11):210.

Learning points: Understanding advanced airway strategies in these cases is vital to prevent further morbidity and mortality.^{1,2} There is limited information on large acquired TEF management, therefore it is crucial to share successful techniques.

42AP09-3

Prehospital definitive airway management during the first year of the swords of iron war

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Background and Goal of Study: Prehospital trauma protocols have increasingly prioritized hemorrhagic shock management over advanced airway interventions except in cases of life-threatening airway compromise or severely inadequate oxygenation. While endotracheal intubation (ETI) is the gold standard for advanced airway management, cricothyroidotomy (CRIC) is a common alternative with high reported success rates. This study evaluates the characteristics of military personnel requiring prehospital definitive airway management during the Swords of Iron War. Materials and Methods: Data were collected from the Israel Defense Forces Trauma Registry (October 2023 - October 2024) for patients undergoing either ETI or CRIC. Variables included injury mechanisms, vital signs, interventions, and provider-reported attempts and success rates. Profound shock was defined as systolic blood pressure (SBP) ≤ 90 mmHg or, if SBP was unrecorded or unmeasurable, mental status change or absence of a peripheral pulse. Hospital admission data were sourced from the Israeli National Trauma Registry.

Results and Discussion: A total of 137 patients were identified, with 96 (70%) undergoing ETI and 41 (30%) undergoing CRIC. The median age was 23 years (interguartile range 21-30), and 97% were male. Blast injuries (61%) and gunshot wounds (28%) were the most common mechanisms. Most patients (91%) were unresponsive upon initial assessment. Face and neck injuries were significantly more common among CRIC patients, and 37% of those undergoing CRIC had at least one failed ETI attempt. Self-reported cumulative success rates were 82% for ETI and 85% for CRIC. Profound shock was present in 81% of patients, with whole blood and freeze-dried plasma administered to 45% and 30%, respectively. Overall, 57 patients (42%) died before hospital arrival. Median transport time was 62 minutes, with no significant difference between the groups. Of 65 patients with inhospital data, 43 (66%) had an Injury Severity Score ≥ 25, and in-hospital mortality was 28%.

Conclusions: Military trauma patients requiring prehospital definitive airway management frequently present in profound hemorrhagic shock and exhibit high mortality rates. CRIC is often performed in the context of facial or neck injuries and following failed ETI attempts. Despite high reported success rates (>80%), the poor overall outcomes suggest these procedures are frequently employed as salvage interventions in critically decompensated patients.

42AP09-5

The association between video vs. direct laryngoscopy and the development of peri-intubation desaturations: a retrospective cohort study

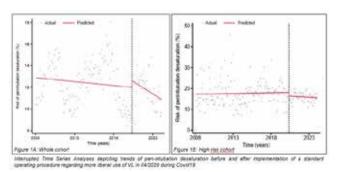
L.-M. Wichelhaus^{1,2}, B.-S. Paschold^{1,2}, L. Kaiser^{1,2}, T. Tenge^{1,3,2}, M.S. Schaefer^{1,3,2}, S.K. Ramachandran^{1,2} ¹Beth Israel Deaconess Medical Center, Department of Anesthesia, Critical Care and Pain Medicine, Boston, United States, 2Center for Anesthesia Research Excellence (CARE), Department of Anesthesia, Critical Care and Pain Medicine, Boston, United States, 3University Clinic Heinrich Heine University Düsseldorf, Department for Anesthesiology, Düsseldorf, Germany

Background: Video laryngoscopy (VL) can improve intubation success rates, reduce intubation attempts and time compared to direct laryngoscopy (DL) [1,2]. As a consequence, the use of VL has become increasingly frequent. However, it remains unclear whether this translates into improved rates of peri-induction hypoxemia at an institutional level. We hypothesized that a substantial shift to VL in our hospital during Covid19 reduced peri-intubation desaturations.

Methods: In this retrospective cohort study, we analyzed 190,758 patients from 2008 until 2024 who underwent surgery under general anesthesia with endotracheal intubation at BIDMC in Boston, USA. The primary exposure was the implementation of a standard operating procedure that triggered a strong increase in the frequency of VL use in 04/2020. The primary outcome was peri-intubation desaturation defined as hypoxemia <90% for >1 minute. Interrupted Time Series Analyses adjusted for a priori defined confounder models were applied.

Results: Between 2008 and 2024, 12.3% of patients had periintubation desaturations. Overall, 40.729 (20.0%) patients were intubated with VL. which rose from 4.2% in 2008 to 76.4% in 2024. In adjusted analyses, there was a steady decrease in peri-intubation desaturations throughout the whole study period which was significantly accelerated with a more liberal use of VL (Pre-intervention slope: coeff. -0.0004, p=0.024; post-intervention slope: coeff. -0.002, p<0.001; change in slope: coeff. -0.001, p<0.001) (Figure 1A).

In a pre-defined high-risk cohort no significant post-intervention effect could be seen (Pre-intervention slope: coeff. 0.0001, p=0.71; post-intervention slope: coeff. -0.001, p=0.21; change in slope: coeff. -0.001, p=0.23; intercept: coeff. -0.029, p=0.29) (Figure 1B).



Figures.

Conclusion: A more liberal use of VL was associated with a decrease in peri-intubation desaturations. In the high-risk cohort no post-intervention effect was noticed, which could be due to a more frequent use of VL for difficult cases. These findings should be confirmed through prospective trials.

References:

1. Cochrane Database Syst Rev. 2022 Apr4;4(4):CD011136 2. BMC Anesthesiol. 2023 Apr 18:23:128

42AP09-6

The impact of the head position on the laryngeal mask airway leak in paediatric patients: prospective randomized control trial

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Background and Goal of Study: Horizontal alignment of the tragus and jugulum (sniffing position, SP) is the recommended head position for adult patient's laryngeal mask airway (LMA) insertion. Recent studies show that beyond sniffing position (BSP, 25% increase in head elevation) can lead to better larynx visualisation and easier airway management. However, here are no available data on head position for LMA placement in paediatric patients. This study aims to compare the incidence of first-try LMA insertion failure and the LMA leak between neutral (NP), sniffing and beyond sniffing head positions in paediatric patients.

Materials and Methods: The prospective randomized observational study was conducted with local Ethical Committee approval and informed consent was obtained. We included all paediatric patients (age 2-19 yrs) undergoing elective surgery with controlled ventilation during general anaesthesia with LMA and without predicted difficult airway management. The head position for the LMA insertion was randomized to NP, SP and BSP. The number of attempts to successful LM insertion was reported and after 5 minutes of artificial ventilation, the LMA leak volume and peak inspiratory pressure (PIP) needed for audible volume leak were measured in all three head positions. The LMA leak volume was defined as a mean of three consequent inspiration and expiration volume differences. Statistic analysis was performed by ANOVA test and Student t-test.

Results and Discussion: In the period of February 2022 to November 2024, we enrolled 163 patients. We did not demonstrate any significant difference in the first try LMA insertion failure incidence (3/51; 4/54; 5/58), nor did it demonstrate any significant difference in the LMA leak volume was 15, 15, 10 mL for NP, SP and BSP. PIP needed for audible volume leak median was 19, 18, and 19 cmH20 for NP, SP and BSP with no significant difference. Intracuff pressure applied in each LMA cuff was also analysed by Student t-test, showing no significant difference with intracuff pressure median of 60 cmH20 for each head position.

Conclusion(s): Different head positions in paediatric patients did not caused the difference in LMA leak volume and in first-time LMA insertion failure.

Acknowledgements: Clinical Trials Network: NCT05035264. This research was supported by Specific University Research provided by MŠMT (MUNI/A/1771/2024, MUNI/A/1733/2024) and MH CZ - DRO (FNBr, 65269705).

42AP09-7

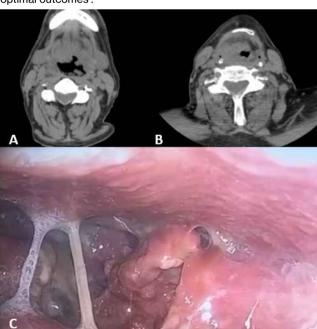
Awake intubation for tracheostomy in a patient with supraglottic carcinoma: a case report

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Background: Managing difficult airways in patients with head and neck malignancies is challenging due to dysphagia, obstruction, and anatomical distortion. Preoperative strategies, including advanced oxygenation techniques and awake intubation, are crucial to prevent airway collapse and maintain oxygenation in high-risk cases.

Case report: Informed consent was obtained. A 58-year-old male with epilepsy, alcoholism, smoking, and supraglottic squamous cell carcinoma presented to the emergency department with total dysphagia. A percutaneous endoscopic gastrostomy (PEG) was proposed. After preoperative anesthesia assessment, otorhinolaryngology was consulted, indicating urgent tracheostomy due to a large supraglottic tumor involving the entire epiglottis, obstructing visualization of the vocal cords (image). Awake intubation via fibroscopy was planned. The patient was placed on highflow nasal oxygen (HFNO). Lidocaine airway topicalization was attempted but not tolerated due to dysphagia. Light sedation with remifentanil infusion was used. Nasal fiberoptic intubation with a 6.5 reinforced tube was accomplished, maintaining adequate oxygenation. The procedure enabled safe tracheostomy and gastrostomy without complications.

Discussion: This case highlights challenges in managing difficult airways in advanced head and neck malignancies. Multidisciplinary discussion and awake fiberoptic intubation are essential for securing the airway in cases of anatomical distortion and risk of collapse. HFNO aids oxygenation, reduces desaturation risks, and improves airway visualization. This case underscores the importance of advanced oxygenation methods and individualized anesthetic approaches for safe airway management, ensuring optimal outcomes1.



Reference:

1. Ahmad I, El-Boghdadly K, Bhagrath R, et al. Difficult Airway Society guidelines for awake tracheal intubation in adults. *Anaesthesia*. 2020;75(4):509–528.

Learning points:

- Detailed airway evaluation is crucial in head and neck tumors.
- HFNO aids in oxygenation and maintains airway patency.
- Awake Intubation ensures safe airway management.
- Adapted airway management improves outcomes.

42AP09-8

The improvement and availability of difficult airway equipment in the emergency department (ED) at Scunthorpe General Hospital – a quality improvement project (QIP)

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Background and Goal of Study: Difficult airway scenarios are commonly encountered in the emergency department. It is challenging to manage them without appropriate airway equipment. The aim of our QIP was to investigate whether the difficulty airway trolley in the emergency department is maintained according to the Difficulty Airway Society (DAS) guidelines.

Materials and Methods: Two random checks of the difficult airway trolley were conducted on the 26th of February and 25th of April 2024 as per the standards of DAS. The results were presented in the anaesthetic audit meeting. The shortfalls were identified and as a result, we liaised with the emergency department in creating a formal checklist of items which are essential to be stocked and monitored. A re-audit was carried out after 6 months. Results and Discussion: Outcome of the initial audits was that only 65% - 75% of contents were present. After implementing a formal checklist, the re-audit data showed that the compliance has improved to 96%. Difficult airway trolley was fully equipped except for the intubating LMA and Bronchoscope. The former was not available in the market and the latter could be borrowed from theatres when required. In addition, ED team agreed for regular checks of the trolley.

Conclusion(s): Our QIP showed an improvement in the compliance of Difficult airway trolley from 65-75% to 96% with implementation of a formal checklist and recording the replacement of an item/items when used.

42AP10-3

Airway management in a patient with Zenker's diverticulum and oesophageal foreign body

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Background: A Zenker's diverticulum (ZD) is a posterior outpouching of the pharyngeal wall that occurs at the junction of the lower part of the throat and the upper portion of the oesophagus⁽¹⁾. Foreign body in the oesophagus can occur after accidental ingestion and its estimated annual incidence is 13 per 100,000 in adults⁽²⁾.

This combination in the emergency setting multiplies the risk and incidence of complications.

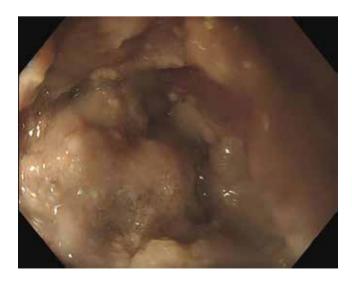
Case Report: An 81-year-old woman with ZD was admitted to the emergency department (ED) because 48 hours before, she swallowed a piece of food. She presented dysphagia, sialorrhea and regurgitation. A gastroscopy with topic anaesthesia was performed in the ED, but it was impossible to complete.

Partial exploration showed abundant liquid and solid content compatible with food impaction at 30 to 40 cm from the dental arch. Awake oral fibreoptic intubation with good tolerance in the OR was performed using nebulization of 4 ml of lidocaine 5% and SAYGO.

Once the airway was secured, general anaesthesia induction was followed. Gastroscopy could be performed, removing a piece of meat and the rest of oesophageal content. The patient was extubated and admitted to the PACU. She was successfully discharged the same day with no complications.

Discussion: Complications are potentially preventable. Deaths are highly prevalent with advanced age and are associated with neurologic, upper gastrointestinal and pulmonary conditions. It is of vital importance to minimize these risks.

As there are no specific anaesthesia protocols, anaesthesia and airway management must be individualized to improve each patient's safety.



References:

1. Dos Santos et al. Challenging Airway Management in Patients with Zenker's Diverticulum, Cureus 13(11): e19578: 2) Schaefer TJ. Trocinski D. Esophageal Foreign Body.In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan 30.

Learning Points: The combination of Zenker's diverticulum and oesophageal foreign body in the emergency setting is challenging because of an increased risk of mortal complications. Thus, it is important to individualize anaesthesia management and ensure patient safety.

42AP10-4

Point-of-Care Ultrasound (POCUS) for complex airway management in hyoid bone and thyroid cartilage fractures

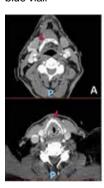
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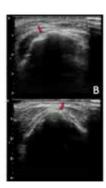
Background: Trauma to the airway may cause acutely life-threatening situation; the recognition and management of these patients can pose a challenge for the anesthesiologist.

Case Report: A 75-year-old male presented to the emergency department with speech difficulty following a strangulation assault during a robbery.

The on-call otolaryngologist ordered a cervical CT, revealing acute traumatic cervical injuries including a hyoid bone and thyroid cartilage fractures, and haematoma infiltration in the glottic plane. Fiberoptic bronchoscopy revealed: edema on the mucosa of the arytenoid cartilages and on both vocal cords, without apparent airway compromise and unaffected subglottic tracheal rings.

The patient was transferred to the Intensive Care Unit (ICU) for airway monitoring in the initial post-trauma hours, with intubation readiness in case of haematoma or edema worsening. Ultrasound was used to control the hematoma in the hvoid bone and thvroid cartilage. The trachea appeared centered with no apparent caliber reduction. Therefore, anticipating a difficult airway in this patient, early POCUS was performed by identifying cricothyroid membrane and marking, using a Tuohy needle and methylene blue vial.







Discussion: For patients with altered anatomy, especially in difficult airway scenarios, identifying the cricothyroid membrane (CTM) location is crucial. If conventional methods fail (palpation), ultrasonography can reliably identify the CTM, facilitating optimal patient positioning. In cases requiring emergency Front of Neck Access (eFONA), the pre-marked CTM location aids swift repositionina1.

References:

- 1. Law JA et al. Can J of Anest 2021: 68: 1405-1436.
- 2. Narula J. JAMA Cardiol 2018; 3: 346-350.
- 3. Lin J et al. Diagnostics. 2023; 13. doi:10.3390/ diagnostics13091541.

Learning Points:

- 1. Ultrasonography has emerged as the fifth pillar of bedside physical examination, supplementing inspection, palpation, percussion, and auscultation2.
- 2. Point-Of-Care Ultrasound (POCUS) is now integral for targeted inquiries, focused differential diagnoses, and procedural guidance3, especially in difficult airway scenarios like trauma with altered anatomy.

42AP10-5

Retrograde scalpel Cricothyrotomy. An alternative technique of FONA (front of neck access)

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Background and Goal of Study: Main drawback of applying FONA technique (front of neck access) is that is too operative for anesthetists. Goal of study is the development of an alternative tecniquue to FONA, as it is described by DAS, more familiar to anesthetists

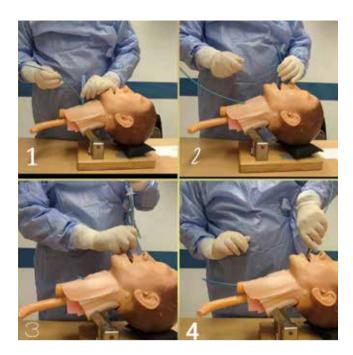
Materials and Methods: Scalpel No11. Bougie guide, endotracheal tube (ENT) No 7. Model. With scalpel No11 we make a small (2mm) direct vertical incision to the cricothyroid membrane of the model. We keep steady the blade and we insert the bougie catheter with the curved tip parallel to the blade at first and then we rotate it in cephalic (retrograde) direction. When the tip of the catheter reaches the pharvnx we hook it with our fingers and pull it out of the mouth. We intubate through the bougie. When the ENT passes the vocal cords the advancement of the endotracheal tube stops.

First we remove the bougie until the back tip reaches the skin. Second we pull the bougie again for only 1 cm max inside trachea. Third we advance the bougie to the final position. Advancement of ENT to final position follows

Results and Discussion: 20 trials were performed. All the trials were performed in model for airway management. Trial average was 45s", SD (8). All trials were successful. ENT advancement through a bougie is a process familiar and less stressful to anesthetists.

That is a major advantage of the method. So there is a high possibility for a less experienced physician to perform FONA on time if he implement a less stressful for him technique. It is also allowed to use wider ENT (more than 7.0), compared to ordinary FONA (6.0). Wider tube is critical for ventilation of patients with

Drawback of the method is that is needed quite well mouth opening and muscle relaxant because we have to hook the tip of the bougie inside the mouth with our fingers.



Conclusion(s): Retrograde scalpel Cricothyrotomy is an alternative high success rate technique to ordinary FONA, for unexpected intubation failure. It is useful for intraoperative implamentation mainly

References:

1. https://das.uk.com/guidelines/das intubation guidelines/ 2. https://www.youtube.com/watch?v=7iCK9gachIM

42AP10-6 An unexpected presence of neurofibroma type 2 tumor in the airway

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Background: Neurofibromatosis (NF) is an inherited single-gene disorders, with an incidence of 1: 3,500 individuals at birth.1

A neurofibroma is a benign mass of the peripheral nerve or nerve root that consists of Schwann cells, fibroblasts, perineurial cells, and mast cells. NF type 1 presents with airway tumors, but NF type 2 rarely does.2

We present a case of NF type 2 in which the neurofibroma was unanticipated found in the hypopharyngeal during intubation.

Case Report: A 30-year-old male with history of NF type 2 and Schwannoma of orbit was scheduled for an orbitotomy with bone flap. Neither recent notes or MRI report mentioned there was a tumor in the airway. During intubation we saw a 3cm tumor in the right hypopharynx (Fig 1).

Even though the tumor hindered the airway, we were able to intubate the patient. A post operative MRI of the neck revealed the presence of a new hypopharyngeal neurofibroma consistent with our clinical finding (Fig 2).

Discussion: MRI is the gold standard in detecting newer lesions but since the clinical management remains same, often these patients are not routinely screened for new lesions.3 While mucosal neuromas are common, larger neuromas in the airway is always unanticipated when the patient does not have any symptoms like hoarseness or difficulty swallowing. In scenarios like this, following difficult airway algorithm is the main management.

References:

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2. Shekar V, Rangdhol V, Baliah WJ, Thirunavukarasu S. An unusual oral manifestation of type 1 neurofibromatosis: A case report and review of literature. J Nat Sci Biol Med. 2015 Jan-Jun;6(1):261-3. doi: 10.4103/0976-9668.149225. PMID: 25810680; PMCID: PMC4367056.

3. Ahlawat S, Blakeley JO, Langmead S, Belzberg AJ, Fayad LM. Current status and recommendations for imaging in neurofibromatosis type 1, neurofibromatosis type 2, and schwannomatosis. Skeletal Radiol. 2020 Feb;49(2):199-219. doi: 10.1007/s00256-019-03290-1. Epub 2019 Aug 8. PMID: 31396668.

Learning Points: The case underscores the importance of being prepared for unexpected airway obstruction. It also brings awareness of airway tumor incidence and patients with NF type 2.

42AP10-7 Late night case of emergent front-of-neck (eFONA) access

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Background: Emergent front-of-neck access (eFONA) is a rarely performed though life-saving procedure in CICO scenarios. This case represents the challenges of eFONA in clinical practice.

Case Report: A 65-year-old male transferred from the private healthcare facility to the hispital due to respiratory distress. On presentation, patient was unresponsive, GCS of 8, RR 26 x/min, breathing with accessory muscle involvement. SpO2 of 86% on 15 L/min oxygen. ABG showed severe respiratory acidosis. PMH: COPD, primary arterial hypertension and class III adiposity. The decision of tracheal intubation was made. After RSI, first intubation attempt was performed with standart geometry MAC4 blade. During direct laryngoscopy Cormack-Lehane IIIb view was noted. The attempt was unsuccessful. Patient desaturated to SpO2 of 65%. The second attempt was VL with hyperangulated blade which also failed. LM iGel #5 was successfully inserted and patient SpO2 raised to 85%. Third attempt was performed using hyperangulated blade and a bougie. During the third attempt the patient desaturated rapidly which lead to cardiac arrest. ROSC was obtained after 5 min of CPR. Ventilation continued through LM and SpO2 remained in low 80-ies. The decision to proceed to emergent front-of-neck access was made. For the first attempt cannula cricothyrotomy (QuickTrach) was utilized.

Due to the large neck circumference and adiposity, we failed to advance the cannula into the trachea. Second attempt was using scalpel-bougie-tube technique. After vertical cut, we managed to palpate the cricothyroid membrane and a 6.0 mm ETC was advanced through the bougie into the trachea.

Afterwads definitive tracheostomy was performed by ENT. The patient was transferred to ICU. He was weaned off the ventilator on day 9. On day 15 he was discharged from the hospital with no neurological deficit.

Discussion: 'Scalpel-bougie-tube' technique is recommended by DAS, whereas wide-bore catheter techniques are associated with high failure risk [1]. The case report clearly demonstrates the challenges of CICO situation.

References:

1. Price, T. M., & McCoy, E. P. (2019). Emergency front of neck access in airway management. BJA education, 19(8), 246-253. Learning Points: Scalpel cricothyroidotomy, using a 'scalpelbougie-tube' should be a first-line eFONA technique. Due to low incidence the obtaining of eFONA skills in real clinical situations is questionable, therefore extensive simulation-based training should be anticipated.

42AP10-8

Electromyographic single twitch stimulation to predict vocal cord opening after a small dose of succinvlcholine for facilitated mask ventilation

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Background and Goal of Study: Neuromuscular blocking drugs (NBDs) open the vocal cords and facilitate mask ventilation. However, NBDs also impede the return to spontaneous breathing by paralysis of the diaphragm, which is problematic in cannot ventilate cannot intubate situations. Thus, the current German S1 guideline on airway management recommends the use of short-acting NMDs such as succinylcholine in patients at risk, but neither a dose is defined, which ensures open vocal cords while diaphragmatic activity is maintained, nor a method is given that monitors the NBD effect on the vocal cords.

We evaluated if the neuromuscular block monitoring of the abductor digiti minimi muscle after electromyographic single twitch stimulation of the ulnar nerve correlates with vocal cord opening. The quantification of succinylcholine's effect on the vocal cords after 0.1 and 0.9 mg/kg IBW was the secondary endpoint.

Materials and Methods: Thirty adult patients scheduled for elective surgery were included. Patients obtained remifentanil and propofol according to institutional standards. A Narcotrend index <65 was reached to ensure an adequate depth of anesthesia. The baseline neuromuscular block was measured, and the vocal cord area was videorecorded to determine baseline conditions. Then, the patient received 0.1 mg/kg IBW of succinylcholine and an additional dose of 0.9 mg/kg IBW after two minutes. After four minutes of continuous monitoring of the single twitch amplitude and recording of the vocal cord area, the trachea was intubated. Results and Discussion: A non-linear generalized additive multilevel model and a bootstrapped linear analysis demonstrated a clear relationship between decreasing single twitch response amplitude and increasing vocal cord opening (p<0.001). Both models identified the response amplitude as a significant predictor of vocal cord opening. Moreover, 0.1 mg/kg IBW succinylcholine was sufficient for 55.0 ± 29.6% vocal cord opening and thus is equivalent to the effective dose for 50% depression of the single twitch.

Conclusion(s): The electromyographic single twitch monitoring can predict vocal cord opening, which allows to exclude closed vocal cords as a cause of insufficient mask ventilation. In addition. 0.1 mg/kg IBW succinvlcholine was often sufficient for mask ventilation and a monitoring thus helps to prevent the administration of unnecessarily high NBD doses.

Acknowledgements: Dipl.-Ing. Britta Weber

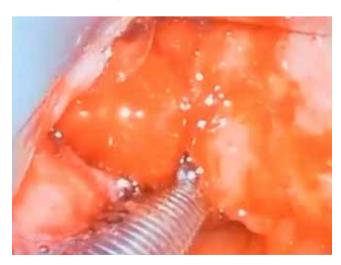
42AP10-9

Elective tracheostomy: management of unpredictable difficult airway secondary to lingual tonsillar hypertrophy

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Background: Lingual tonsils are a part of Waldeyer ring consisting of lymphoid tissue located at the base of the tongue. Lingual tonsillar hypertophy secondary to inflammation or neoplastic process can go unnoticed during periopertiave period creating an unexpected difficult airway scenario.

Case Report: We present a 42 year old gentleman who was referred to our tertiary neurosurgical center for endonasal transsphenoidal pituitary ademona excision. Medical history was remarkable for Obstructive Sleep apnea and obesity. Perioperative airway examination showed large tongue. Mallampati grade 2.sternomental and thyromental distances within normal. General anesthesia induction commenced with 100 mcg fentanyl, lidocaine 90mg, and propofol 120mg, and cisatracurium 12 mg was given. First attempt with VL macintosh blade revealed Cormack Lehane grade 4 with large kissing tonsils. Second attempt using hyperangulated blade was successful despite mild oozing from the hypertrophied tonsils. After surgery, the patient was kept intubated for better assessment of the degree of airway edema in the icu. Dexamethasone was started 8 mg q6. MRI Neck revealed right tonsillar hemorrhagic mass like solid lesion size 7*4 cm involving the Palatine and lingual tonsils with evidence of abnormal signal and enhancement extending towards the base of the tongue on the right side. Further VL examination showed worsening airway edema. Desicion of trachestomy was made on day3 postoperative. After trachestomy, the patient was discharged to the ward the following day and followed up in ENT clinic.





Learning Points: Lingual tonsils in airway management especially with pituitary secreting tumors and timing of tracheostomy in airway edema management.

42AP10-10

Illuminating the difficult airway: a meta-analysis of video versus direct laryngoscopy across expertise levels

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Background and Goal of Study: Airway management is critical in anesthesia, where achieving first-attempt intubation success minimizes complications such as hypoxemia, aspiration, and cardiac arrest. Video laryngoscopy (VL) has revolutionized airway management by offering enhanced visualization and higher success rates compared to direct laryngoscopy (DL), particularly in difficult airway scenarios. However, its efficacy across operator expertise levels remains uncertain. This meta-analysis evaluates the efficacy of VL versus DL in difficult airways, focusing on first-attempt intubation success, glottic visualization, intubation time, and complications. Subgroup analysis examines the impact of operator expertise (novice vs. expert).

Materials and Methods: Four randomized controlled trials (RCTs) comparing VL and DL in difficult airway patients were analyzed. The primary outcome was first-attempt intubation success. Secondary outcomes included glottic visualization (Cormack-Lehane Grade 1–2), intubation time, and complications such as hypox-

emia. Subgroup analysis assessed novice versus expert operators. Pooled odds ratios (OR) and mean differences (MD) were calculated using random-effects models, with heterogeneity assessed using I² statistics.

Results and Discussion:

- First-Attempt Success: VL significantly improved success rates (Pooled OR: 3.07; 95% CI: 2.63–3.58).
- Glottic Visualization: VL improved Grade 1–2 visualization (Pooled OR: 5.29: 95% CI: 1.59–17.58).
- Intubation Time: VL reduced time to intubation by 6.56 seconds (MD: -6.56; 95% Cl: -7.66 to -5.46).
- Complications: VL showed a trend toward reducing hypoxemia (Pooled OR: 0.38; 95% CI: 0.09–1.65), though not statistically significant
- · Subgroup Analysis:
- Novice Operators: VL improved first-attempt success (Pooled OR: 2.03: 95% CI: 1.64–2.51).
- Expert Operators: VL further enhanced success rates (Pooled OR: 4.86; 95% Cl: 3.89–6.08).
- Heterogeneity: High variability (I² = 91.39%) reflected differences in patient populations and devices.

Conclusion(s): Even with video laryngoscopy, novice operators still need training in orotracheal intubation. Although VL improves first-attempt success, glottic visualization, and intubation time, especially in difficult airways, hands-on experience remains essential. Incorporating VL and structured training into airway management protocols is vital. Future research should refine recommendations for its use.

42AP10-11

Tracheal tumor surgery with a Tritube[®] and flow-controlled ventilation: an anesthetic challenge

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Background: Tumor resection and tracheal anastomosis is considered the definitive treatment in most of upper airway neoplasias. In these cases, small-lumen ventilation can be a appropriate airway management.

Case Report: We report the clinical case of a 70-year-old patient with a 17 mm × 16 mm × 19 mm mass arising from the posterior wall of the trachea in the computed tomography scan, which occlude the tracheal lumen by 80%. He was proposed for surgery and general anesthesia was induced. To isolate the airway, we decided to use the endotracheal tube with the Tritube® device, whose external and internal diameters are 4.4mm and 2.5mm respectively. According to the surgeons, the plan was formulated to avoid the excessive manipulation of the area to prevent bleeding due to the friability of the tumor and providing de maximal surgical access to the trachea. First, we inserted 4# Ambú® laryngeal mask (LMA) to ventilate our patient the first part of the surgery. Then the fiberoptic bronchoscopy was inserted through

the LMA and and a 0,035 inch Aerstent® guide wire was placed into the trachea distal to the tumor. We used this guide to lead the Tritube® into the trachea (and thus avoid blind manipulation in the tumor area), and its cuff placement was then confirmed by fiberoptic scope (below the lesion and above the carina). Subsequently, the tube was attached to an Evone® ventilator with optimal oxygenation and ventilation (FIO2=50%, inspiration flow 15L/ min, I:E ratio=1:1, peak pressure= 17mbar, EEP= 6mbar).

Discussion: Tracheal surgery poses significant challenges to the anaesthetist, especially when its lumen is reduced. The goal should be to achieve optimal surgical conditions while maintaining a secure airway. The Tritube is an alternative which provides both improved surgical access and adequate gas exchange.

References:

Molteni G, Dallari V, Segato E, Mattioli F. Post-Covid-19 Airway Stenosis: Tracheal Resection-Anastomosis Using The Tritube® Ventilation. Laryngoscope. 2024 Feb;134(2):897-900. doi: 10.1002/lary.30859. Epub 2023 Jul 19. PMID: 37466298. Saroa R, Gombar S, Palta S, Dalal U, Saini V. Low tracheal tumor and airway management: An anesthetic challenge. Saudi J Anaesth. 2015 Oct-Dec;9(4):480-3. doi: 10.4103/1658-354X.159483. PMID: 26543474; PMCID: PMC4610101.

Learning Points:

Tracheal tumors can provide a unique challenge to the anesthetist

High frequency jet ventilation can be useful in cases of reduced tracheal lumen.

42AP10-12

Comparison of ultrasound guided lung sliding sign and conventional auscultatory method to evaluate endotracheal tube depth in pediatric patients

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Background and Goal of Study: Accurate placement of the endotracheal tube (ETT) is essential in pediatric patients to ensure effective ventilation and prevent complications. Traditional auscultation methods and recent ultrasound techniques, such as the lung sliding sign (LSS), are used to verify ETT depth. The lung sliding sign is an ultrasound phenomenon that helps assess lung expansion and diaphragm motion during mechanical ventilation, which may serve as a reliable method to confirm ETT position. This study compares the efficacy of ultrasound-guided LSS with conventional auscultatory methods for determining the correct depth of ETT in pediatric patients.

Materials and Methods: This study was conducted through a survey in 6 hospitals where there was experience with this evaluation method and included 70 pediatric patients (aged 4 years to 8 years) who underwent elective surgery requiring general anesthesia and endotracheal intubation. After intubation, two methods were used to verify the correct ETT depth: (1) conventional auscultatory technique, where bilateral breath sounds were assessed, and (2) ultrasound, where the lung sliding sign was visualized using a linear probe placed on the chest wall in the midclavicular line.

Both methods were performed by experienced clinicians immediately after intubation and before starting surgery. Intubation was considered correct when symmetrical and effective bipulmonary ventilation was observed. Data were analyzed to assess the diagnostic accuracy, sensitivity, specificity, and agreement between the two methods.

Results and Discussion: The ultrasound-guided LSS method showed a higher sensitivity and specificity compared to the conventional auscultatory method. The lung sliding sign correctly identified the optimal ETT depth in 95% of cases, with a sensitivity of 93% and a specificity of 97%. In contrast, the auscultatory method showed a sensitivity of 78% and a specificity of 85%. The agreement between the two methods was moderate, with a kappa coefficient of 0.72.

Conclusion(s): Ultrasound-guided lung sliding sign is a highly accurate and reliable method for determining the correct depth of the endotracheal tube in pediatric patients, outperforming the conventional auscultatory method in both sensitivity and specificity. This technique provides a non-invasive, real-time alternative that can improve the safety and accuracy of pediatric intubation.

42AP11-1

Anesthesiological management of a patient with an incidental large lingual cavernous haemangioma

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Background: The induction of general anesthesia in patients with airway compromise is challenging, particularly when oral vascular tumours with high propensity for bleeding are present. Hemangiomas are benign vascular tumors characterized by rapid endothelial cell growth, with 50%-60% occurring in the head and neck region. Common intraoral locations include the lips, buccal mucosa, and tongue. We present a case of an 82-year-old woman with an incidental asymptomatic cavernous lingual hemangioma and discuss its anesthesiological management for intubation during general anesthesia prior to elective resection.

Case Report: An 82-year-old woman with an endometrial carcinoma underwent thorough clinical and laboratory evaluation prior to an elective total hysterectomy with bilateral salpingo-oophorectomy (THBSO). A large lingual lesion was discovered during examination, which subsequent imaging identified as a cavernous hemangioma. Anesthetic considerations included challenges with mask ventilation and intubation, bleeding risk from the hemangioma, and potential blood aspiration. Anesthesia induction, mask ventilation, and intubation using a flexible KARL STORZ C-MAC® video laryngoscope proceeded smoothly, as did extubation. The patient was discharged on the fourth postoperative day following an uncomplicated recovery.

Discussion: Comprehensive assessment of managing airways in oral cavity hemangioma cases allows for intubation and general anesthesia without advanced airway tools. Strategic difficult airway management is crucial for optimising outcomes in such cases.

References:

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- 2. Marciniak D, Kraenzler E: Airway Management and Lung Isolation in a Patient With a Massive Cavernous Hemangioma of the Tongue, Journal of Cardiothoracic and Vascular Anesthesia, Vol 27, No 6 (December), 2013: pp 1337-1338

Learning Points: Airway management in patients with intraoral hemangiomas poses significant challenges that include difficult ventilation and intubation, and an increased risk of bleeding and aspiration. Patients with large lingual cavernous hemangiomas often exhibit significant anatomical distortion that complicates airway management.

42AP11-3

A randomized crossover comparison of the Vie Scope and the STORZ CMAC Miller Video laryngoscope in a Pierre Robin Manikin

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Background: The Bébé Vie Scope is a new pediatric single use airway devise following the principle of an anterior commissure scope used for laryngoscopy in ENT. In adult studies, the Vie Scope showed non-inferiority compared to video laryngoscopy. In a study using a pediatric manikin representing a 6 year old, it showed comparable success rate and time to intubation to video laryngoscopy. No study is published on the use of the Vie Scope in the infant airway. A Pierre Robin Manikin was used to simulate a pediatric difficult airway as previously published.

Methods: 50 anesthesiologists intubated a Pierre Robin Manikin representing an anatomical correct one year old. Following a full IRB approved consent, participants received a standardized description and time to train the Bébé Vie Scope (BVS) as well as the STORZ CMAC Miller 1 video laryngoscope (VL) using a normal airway pediatric manikin. For the study, participants intubated the Pierre Robin manikin in a random order using BVS and VL. Success Rate, Time To Best View (TTBV) and Time To Intubate (TTI) in seconds, Percentage Of Glottic Opening view (POGO) in % and Ease of Use (VAS) using a likert scale with 10 being the easiest, was measured. Unsuccessful intubation was esophageal intubation or TTI > 60 sec. Null hypothesis was TTI being similar for both devices. Data were analyzed using a paired t-test and presented as Median, interquartile range (IQR), Min Max. Statistical significance was P<0.05 (#).

Results: Success rate was 48/50 (96%) for BVS and 49/50 (98%) for VL. TTBV was significantly longer and POGO significantly worse in BVS versus VL. There was no significant difference between BVS and VL for TTI and VAS.

	BVS	VL	
TTBV (sec)	8 (6, 12) [3, 34]	6 (5, 8) [4, 31] #	P < 0.001
TTI (sec)	20 (16, 25) [11, 41]	22 (18, 30) [11, 54]	P = 0.191
POGO (%)	80 (50, 92) [10, 100]	90 (80, 100) [25, 100] #	P = 0.002
VAS	8 (7, 10) [1, 10]	9 (8, 10) [2, 10]	P = 0.066

Table: TTBV, TTI, POGO, VAS for BSV and VL. Median (IQR) [Min Max]. # P<0.05.

Discussion and Conclusion: The clinically important success rate and TTI using the BSV was comparable to VL, despite a significant prolonged TTBV and reduced POGO, similar to other studies. Both BVS and VL were easy to use. The Vie Scope plays a role in the difficult pediatric airway, especially when video laryngoscopy is not feasible due to weight (resuscitation bags), rare occasion (off-site MRI) or cost. Case reports and studies in children are needed.

42AP11-4

Evaluating the impact of videolaryngoscope adoption on the characteristics of difficult airway consultations in a tertiary care setting: a retrospective cohort study

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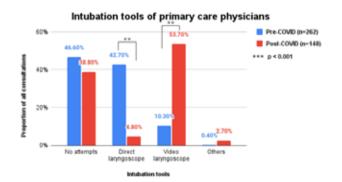
Background and Goal of Study: Emergent tracheal intubation is challenging, associated with significant morbidity. While all hospital physicians receive airway management training, anesthesiologists provide backup consultations for failed intubations. Increased videolaryngoscope use during the COVID-19 pandemic prompted this study to investigate changes in consultation patterns for difficult airways.

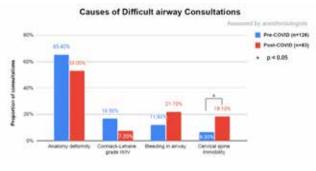
Materials and Methods: We retrospectively analyzed data from our department's emergent intubation registry (August 2017-September 2019, pre-COVID; October 2022-December 2023, post-COVID), including patients aged ≥20 years. We compared intubation indications, tools, and medications used by primary care physicians and anesthesiologists, and the anesthesiologist's assessment of airway difficulty.

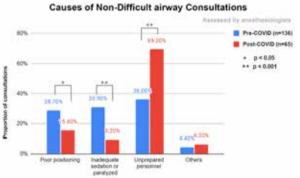
Results and Discussion: 262 and 148 patients were included in each period respectively. There were no statistical differences in age, gender or places where emergent tracheal intubation were performed in both groups. Videolaryngoscope was significantly more applied by the primary care physicians in the post COVID-consultations (10.3% vs. 53.7%).

While overall difficult airway rates in consultations did not significantly differ (48.1% vs. 56.1%), post-COVID consultations found significantly more cervical spine immobility (6.3% vs. 18.1%). Conversely, unprepared personnel (including poor skills, lack of confidence or inadequate equipment use) were significantly more frequent in non-difficult airway consultations post-COVID (36.0% vs. 69.2%).

Conclusion(s): Increased videolaryngoscope use likely contributed to the proportional change in difficult airway types. Emergent anesthesiologist consultations persisted due to inadequate provider skill or confidence, highlighting the need for enhanced videolaryngoscopy training in future airway management workshops.







42AP11-5

Videolaryngoscopy vs. direct laryngoscopy in paediatric tracheal intubation: systematic review & meta-analysis

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Background and Goal of Study: Paediatric tracheal intubation presents unique challenges due to anatomical and physiological differences in children compared to adults. These include a rostral larynx, a narrow, floppy, u-shaped epiglottis and reduced oxygen reserves. Limiting the number of attempts is critical to minimize complications such as hypoxia, airway trauma, and cardiovascular instability. Videolaryngoscopy (VL) has emerged as a potential alternative to direct laryngoscopy (DL). Despite growing evidence supporting its use, the comparative efficacy, safety, and clinical outcomes of VL versus DL in paediatric tracheal intubation remain under investigation. This systematic review and metaanalysis aim to provide a

comprehensive evaluation of VL versus DL.

Materials and Methods: We systematically searched MEDLINE, Embase, Cochrane Central Register of Controlled Trials, CINAHL, Web of Science Core Collection, and Scopus on 5 February 2024. (PROSPERO registration number: CRD42024498524). The review adhered to Cochrane methodology and included randomized controlled trials (RCTs) comparing videolaryngoscopy and direct laryngoscopy for tracheal intubation in paediatric patients (<16 years).

Results and Discussion: We found 20,389 articles. After title and abstract screening 51 RCTs published between 2009 and 2024, including 4,856 pediatric patients, met the inclusion criteria. The overall risk of bias was assessed low in 22 trials, with some concerns in 24 trials, and high in 5 trials. First attempt tracheal intubation success was reported in 39 RCTs (3,776 patients). VL showed similar rates compared to DL (RR: 1.03, 95% CI: 0.99-1.08, p=0.17). Percentage of

glottic opening was reported in 18 RCTs (1,362 patients). VL significantly enhanced glottic visualisation (mean difference: 10%, 95%CI: 3-16).

Conclusion(s): In paediatric patients, videolaryngoscopy had similiar first attempt success rates when compared to direct laryngoscopy. Videolaryngoscopy improves glottic visualisation in pediatric tracheal intubation, which may be particularly advantageous in challenging airway scenarios, supporting its integration into airway management protocols. Future studies should aim to standardise outcomes and terminology and device used, particularly in specific pediatric subgroups, like children with anatomically or physiologically difficult airways.

42AP11-8 Ludiwg's angina: a face off between anesthesiologist and airway!

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Background: Ludwig's angina is an uncommon, critical airway challenge for an anesthetist. It is a life-threatening infection of the soft tissue of the floor of the mouth & neck which leads to lethal complications like airway obstruction, trismus, aspiration pneumonia.

Case report: We are reporting a case of Ludwig's angina posted for incision & drainage under general anesthesia. Patient had decreased mouth opening (1cm) & a diffuse swelling on anterior part of the neck extending superiorly from angle of mandible bilaterally to lower border of cricoid cartilage inferiorly. Ultrasound neck-hypoechoic collection in the muscular plane of the anterior neck & involvement of submandibular glands with multiple lymph nodes. Patient was prepared for awake nasal fibreoptic intubation. Identification & marking of cricoid & thyroid cartilage by ultrasonography was done to allow emergency cricothyroidotomy for which an apparatus was made using 16 G iv cannula attached to a 2ml syringe and a connector of 7mm ID ET Tube.Para-oxygenation using Nasal Oxygenation During Efforts of Securing A Tube was done. Fibreoptic view showed significant airway edema thus, patient was extubated on POD, & subsequently discharged.



Discussion: Ludwig's angina starts as a mild infection, fever, dysphagia & rapidly progresses to trismus & tongue elevation. The most serious complication is airway compromise due to expanding edema of the soft tissues of the neck. Awake fibreoptic intubation is the preferred method of airway management. Limited mouth opening, distorted airway anatomy, upper airway edema, risk of rupture of abscess makes direct laryngoscopy, blind nasal intubation, supraglottic airway insertion difficult. Front of neck access would also be difficult as the surface anatomy is distorted.

References:

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Learning points: Airway management in Ludwig's angina has to be individualized depending on the patient, judgement & expertise of the anesthesiologist. Rapid airway management, appropriate antibiotic therapy & surgical intervention are the goals of treatment.

42AP11-9

Upper lip bite test: a valuable predictive test for difficult intubation. A single-center prospective observational study

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Background and Goal of Study: Unanticipated difficult airway is the most important cause of anesthesia-related morbidity and mortality. The aim of this study is to compare the diagnostic value of the upper lip bite test (ULBT) with other predictive tests for difficult intubation.

Materials and Methods: In this prospective observational study the following tests for evaluation of difficult endotracheal intubation were used: mouth opening, upper lip bite test, mandibular protrusion, thyromental distance, sternomental distance, interincisor gap, Mallampati test and head and neck movement. Upper lip bite test (ULBT) was scored using an ordinal scale of 1 (lower teeth can bite above the upper lip), 2 (lower teeth can bite the upper lip) and 3(lower teeth cannot reach the upper lip). This study enrolled 50 patients above the age of 18 who underwent elective or emergency surgery. The modified Cormack-Lehane classification system was used to assess the laryngoscopic view during direct laryngoscopy. IDS (intubation difficulty scale) was used for quantitative evaluation of intubation complexity.

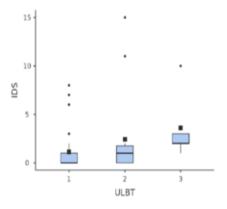


Figure 1. Differences in IDS score between ULBT levels

Results and Discussion: 31 patients (62%) were graded as ULBT 1 score, 14 patients (28%) as ULBT 2 score and 5 patients (10%) as ULBT 3 score. A significant difference in intubation difficulty was found for patients with ULBT level 3 compared to level 1, while statistical significance was lost between levels 1 and 2, and 2 and 3 (Figure 1).

Spearman's rank correlation test showed a statistically significant correlation between IDS and ULBT level which was weak to moderate. A strong correlation was found between IDS and Cormack-Lehane grade. No significant correlation between intubation difficulty and other measured variables was found.

Conclusion(s): Upper lip bite test is a simple bedside test that showed a significant correlation with IDS and should be used in clinical practice. Drawbacks of our study are: a small sample, including toothless patients and a small number of patients with limited head and neck movement. Future studies should include patients with possible/documented difficult airway, obese patients and patients with limited head and neck movement.

42AP11-10

The effect of morphological changes following extensive resection and reconstruction for oral cancer on subsequent tracheal intubation

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Background and Goal of Study: Extensive resection and reconstruction for malignant tumors of the oral floor, maxilla, and mandible cause morphological changes within the oral cavity. This study aims to investigate the effects of these changes on subsequent tracheal intubation.

Materials and Methods: Patients were included who underwent extensive resection and reconstruction for malignant tumors of the oral floor, maxilla, or mandible at our hospital between September 2011 and September 2024, and subsequently underwent other surgeries under general anesthesia requiring tracheal intubation. Patient backgrounds, reconstruction sites, the presence of obstructions to tracheal intubation, and the use of airway devices were investigated. Fisher's exact test was employed for statistical analysis, with a p-value < 0.05 considered significant.

Results and Discussion: 66 cases of extensive resection and reconstruction were performed during the study period. Among them, 27 cases were selected for the study. Subsequently, 51 cases of surgery under general anesthesia with tracheal intubation were performed. The reconstruction site was the maxilla in 20 cases and the mandible in 31 cases.

After extensive resection and reconstruction, the rate of difficult tracheal intubation increased from 11.1% (3 out of 27 cases) to 39.2% (20 out of 51 cases) (p=0.001). The causes included limited mouth opening in 8 cases, abnormal positioning of the vocal cords in 4 cases, difficulty with laryngoscopy in 3 cases, oral deformities in 2 cases, and other factors in 1 case.

Additionally, the frequency of use of airway devices also increased from 48.1% (13 out of 27 patients) to 84.3% (43 out of 51 patients) (p=0.001).

Conclusion(s): In cases after extensive resection and reconstruction for oral cancer, tracheal intubation was often more difficult than before the surgery due to anatomical and functional changes.

Nevertheless, tracheal intubation was successfully performed in all cases. It is considered that anticipating difficult tracheal intubation in advance and using airway devices proactively contributed to this success.

42AP12-1

Towards safer airway management: an audit of preoperative assessment practices

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Background and Goal of Study: Effective preoperative airway assessment is crucial to guide anesthetic management, minimizing the risk of unanticipated difficult airways (DA) and aspiration. This audit aims to assess the consistency of preoperative airway assessment, the use of standardized documentation of DA, and identify areas for improvement to enhance patient safety.

Materials and Methods: The audit was conducted at a district hospital in Portugal during February 2020 (pre-COVID-19 period), June 2021 (COVID-19 period), and June 2022 (post-COVID-19 period). Patients older than 18 years who attended pre-anesthetic consultations were included.

Results and Discussion: A total of 594 patients were included in the audit, 228 in the pre-COVID, 209 in the COVID, and 157 in the post-COVID periods. Airway assessment was conducted in 291, 146 and 152 patients in the pre-COVID, COVID and post-COVID periods, respectively. Overall, 517 patients (87%) underwent airway assessment. Of these, 40% used the El-Ganzouri score. When not used, the most commonly assessed parameters were the Mallampati score, mouth opening, and neck mobility. 96% of patients with an El-Ganzouri score ≥ 4 were flagged for potential DA. Seven cases of DA were identified. Of these, 4 cases were unpredictably difficult airways. In the pre-COVID and post-COVID periods, 75% and 50% of these cases were notified, respectively, but no DA alert cards were issued. During the COVID period, notification rates reached 100%, with all cases receiving DA alert cards. This finding aligns with other studies demonstrating low compliance with DA notification practices. One in four patients had ≥2 aspiration risk factors, but only 3% were documented. Although no aspiration cases were observed, underreporting may limit the opportunity to implement preventive strategies.

Conclusion: This audit reveals that while preoperative airway assessment practices were generally robust, significant variability in protocol adherence and documentation was observed across the three periods. The COVID-19 pandemic disrupted practices but also prompted adoption of structured documentation, as evidenced by improved notification rates. Standardizing airway assessment protocols, ensuring consistent use of predictive tools like the El-Ganzouri score, and emphasizing documentation through DA alert cards may be critical for improving patient safety. The low flagging rate for aspiration risk highlights another area for improvement.

Artificial Intelligence assisted tracheal intubation: preliminary data on correct tube placement - a pilot study

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Background: Tracheal intubation is a core competence in anaesthesia. Failed intubation or non-detected oesophageal intubation can jeopardise patients. LarynGuide™, a newly developed assistive software implemented at a C-MAC video laryngoscope (Karl Storz, Tuttlingen, Germany), guides laryngoscopy and advises on the position of the tracheal tube. This first-in-human study assesses if larvnGuide™ advice is correct and reliable compared to the judgement of the human airway operator.

Materials and Methods: This ongoing prospective, single-centre, sponsor-initiated, investigator-designed study recruited 54 of 110 planned patients scheduled for elective surgery requiring tracheal intubation, after Ethics Committee approval (BASEC 2024-D0041) and patients' written informed consent. After standardised induction of anesthesia, laryngoscopy with a C-MAC video laryngoscope (Macintosh blade No. 3 or 4) and tracheal intubation were performed by the board-certified anesthesiologist. During that tracheal intubation, larynGuide™ rans parallel on a second screen, covered to the airway operator but visible to the study team. After successful intubation, the airway operator visually assessed the correctness of the tracheal tube position and checked for proper end-tidal CO₂ readings. The primary endpoint was the accuracy of larynGuide™ on the tracheal tube position. We hypothesised that the sensitivity was 95% or above.

Results: So far, 47 patients out of 54 were analysed. Seven patients were excluded because a D-Blade was used or a Rapid Sequence Intubation was performed. Tracheal tube placement was correctly identified by larynGuide™ in 44 out of 47 patients, resulting in a sensitivity of 0.936 (95%-Cl: 0.82-0.99). In three patients, larynGuide™ assessed the tube position not correctly: In one case, larynGuide™ displayed the words "bad intubation" after the tracheal tube was correctly positioned in the trachea. In the other two patients, larynGuide™ displayed neither a green light nor the words "bad intubation". In all three cases, the lens was foggy and vision was impaired. There were no oesophageal intubations up to this point; therefore, no statement regarding the specificity can be made.

Conclusion: This preliminary data suggests a success rate of the larynGuide™ software of 93.6%. Impaired laryngoscopy vision due to fogging was one of the limiting factors for the software's accuracy.

42AP12-3

Can't intubate, can't oxygenate crisis management: case report on the use of tulip airway

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Background: "Can't intubate, can't oxygenate" (CICO) scenarios represent rare but catastrophic emergencies in anesthetic practice. These situations require rapid and effective decision-making to prevent severe consequences (1). This report details the use of the Tulip Airway in managing a critical CICO crisis where conventional techniques failed. The case demonstrates the potential of this device in challenging airway management.

Case report: A 44-year-old male scheduled for radical nephrectomy (ASA II) had a BMI of 34.7, hypertension and a 20-pack-year smoking history. Airway assessment suggested manageable intubation (neck circumference: 42 cm; mouth opening: 3 cm; thyromental distance: 8 cm), though restricted neck extension was noted. During induction, face mask ventilation and supraglottic device (i-gel size 5) placement failed, leading to oxygen desaturation (SpO2: 77%). Attempts at direct and videolaryngoscopy revealed a Cormack-Lehane Grade 4 view, preventing intubation. The Tulip Airway (size 3) was introduced, achieving effective ventilation (EtCO2: 44 mmHg). This allowed stabilization of patient and subsequent blind intubation trial using a Frova bougie and a size 8 endotracheal tube. The surgery proceeded uneventfully over four hours. For extubation, the Tulip Airway was reinserted, ensuring continued ventilation. The patient recovered well, with no complications, following 24-hour ICU monitoring.

Discussion: Managing CICO scenarios requires an approach to secure effective ventilation. In this case, the Tulip Airway provided a life-saving solution when traditional methods failed, allowing for controlled intubation planning (2). This case demonstrates Tulip's efficacy and reliability in critical situations. Further research is warranted to evaluate its broader utility in airway management protocols.

References:

- 1. Apfelbaum, Jeffrey L., et al. "2022 American Society of Anesthesiologists practice guidelines for management of the difficult airway." Anesthesiology 136.1 (2022): 31-81.
- 2. Robinson, P. N., et al. "A pilot study to examine the effect of the Tulip® oropharyngeal airway on ventilation immediately after mask ventilation following the induction of anaesthesia." Anaesthesia 69.7 (2014): 707-711.

Learning points: The Tulip Airway is an effective alternative in CICO situations where traditional methods fail. Its simplicity and ease of use make it a valuable addition to airway management strategies, particularly for emergency settings.

The management conundrum of a Myasthenia Gravis patient with high aspiration risk for ultra-short surgery

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Background: Myasthenia Gravis (MG) presents a unique challenge for the anaesthetist, particularly during rapid sequence induction. Standard practice with neuromuscular blocking agents (NMBAs) can lead to prolonged paralysis and increased risk of respiratory complications. This case details the successful use of total intravenous anaesthesia (TIVA) with propofol and remifentanil for RSI in a patient with MG undergoing a short procedure to remove a foreign body from the esophagus.

Case Report: The patient, a 60-year-old Chinese female (BMI 30) with well-controlled ocular MG and a small thymoma, was pacemaker-dependent following a previous aortic valve replacement. She presented with a swallowed fish bone lodged at the C7/T1 level. She was noted to have a potentially difficult airway (Mallampati 3, short neck). The surgical plan was a rigid esophagoscopy and removal of foreign body. Given the high aspiration risk and expected short duration of the procedure, RSI was performed with total intravenous anaesthesia (TIVA), avoiding the use of NMBAs. Intubation was achieved using video laryngoscopy, with effect site target-controlled infusions (TCI) of propofol (Schneider Cet 6mcg/ml) and remifentanil (Minto Cet: 7ng/ml), facilitated by topical 10% lignocaine sprays to the glottis. Transient hypotension (BP 77/52, HR 60) was noted post-intubation, and managed by reducing TCI doses and administering phenylephrine. The patient was maintained on mechanical ventilation to reduce respiratory effort. A 2cm fishbone was successfully removed, the patient was extubated uneventfully and discharged the following day.

Discussion: This case demonstrates the effectiveness of RSI without NMBAs in MG patients undergoing ultra-short duration surgery. Remifentanil offers several advantages - avoiding prolonged paralysis from succinylcholine and the unpredictable dosing or reversal requirements with a rocuronium and sugammadex combination. Although the use of remifentanil may lead to hemodynamic instability, its predictable pharmacokinetics and ultrashort duration of action make it an ideal agent - allowing for both optimal conditions for intubation and rapid adjustment of doses to manage hemodynamic changes after intubation. Further studies are recommended to optimise remifentanil dosing and compare clinical outcomes between MG patients receiving remifentanil and NMBAs for RSI.

Learning Points: RSI with remifentanil can be used in short surgeries with high aspiration risk.

42AP12-5

Apneic oxygenation with high-flow nasal oxygen: a safer approach to microlaryngeal surgery

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Background: Microscopic laryngeal surgery requires sharing the airway between surgeons and anesthesiologists, and demands coordination and teamwork to optimize the procedure. The use of HFNO for surgery under apneic oxygenation allows for a clear surgical field and avoids potential complications secondary to Endotracheal Intubation and Jet Ventilation, such as: vocal cord injuries, edema, and ischemia of the tracheal mucosa, or barotrauma. Case Report: A 53-year-old female patient, ASA I, was scheduled for MLS with laryngoplasty expansion for treatment of dysphonia. for an estimated duration of 20 minutes. This patient had undergone several MLS procedures due to recurrent dysphonia, and had no other relevant history and no predictors of difficult airway. In addition to standard monitoring, cerebral oxygenation, depth of anesthesia with Bispectral Index, and neuromuscular blockade with TOF Scan were monitored. General intravenous anesthesia under apneic oxygenation with HFNO was decided. After preoxygenation with a face mask to an EtO2 >90%, anesthesia was induced with TCI of remifentanil 1 ng/ml, TCI of propofol 3-4 mcg/ ml, and rocuronium 1.3 mg/kg. After induction, arterial blood gas (ABG) analysis was performed, revealing no alterations. The procedure was carried out under apneic oxygenation with HFNO (O2 at 70L/min), with an endotracheal tube at the surgical table for the need of ETI in case of desaturation (SpO2 < 90%). The procedure lasted 20 minutes, without desaturation. At the end of the surgery, neuromuscular blockade was reversed with 4 mg/kg of sugammadex, intravenous infusions were stopped, and ABG was performed, revealing respiratory acidosis (PaCO2 66.2 mmHg. PaO2 233 mmHG, and pH 7.25). The patient was sent to the postanesthesia care unit, where she remained and developed a mild, bilateral headache. After 30 minutes, ABG was repeated, showing correction of respiratory acidosis (PaCO2 41.3 mmHg, pH 7.38) and complete reversal of the headache.

Discussion: The administration of oxygen under HFNO during microlaryngeal surgery under apneic oxygenation is a safe way to ensure oxygenation, optimizing the surgical field and avoiding complications arising from multiple ETIs or JV.

Reference:

Gustafsson et al. Br J Anaesth. 2017;119(4):610-7; Novakovic et al. Microlaryngeal Laser Surgery. The Laryngoscope, 133:634-639, 2023

Learning Points: HFNO as a Safe Alternative for Microlaryngeal Surgery, Careful Patient Selection and Monitoring.

Delayed onset of airway compromise in traumatic neck hematoma: a case of successful awake fiberoptic intubation

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Background: Managing cervical hematomas after trauma is challenging, especially with airway compromise. Neck hematomas, caused by blunt force, lead to airway obstruction, vascular injury, respiratory failure. Our case highlights complexities of ensuring airway safety in massive neck hematoma.

Case Report: A 65-year-old asymptomatic male presented to the emergency department 5 hours post motor vehicle collision. Later he developed neck swelling, alterations in voice, difficulty swallowing. Vital signs remained stable. Neck ultrasound revealed a large 10x5 cm hematoma-like mass, confirmed by CT scan. Active extravasation from ascending thyroid artery's branch and thyroid rupture were suspected, displacing structures and narrowing tracheal, laryngeal, and oropharyngeal lumens.

Further evaluation via fibro endoscopy identified hematoma on the right posterior pharyngeal wall, extending into the right laryngeal side and displacing the epiglottis to the left. The epiglottis got swollen, leading to difficulty in visualization of narrowed glottic opening. Awake intubation using flexible fiberoptic bronchoscope with an armored endotracheal tube was chosen as safest method for intubation. Angiography and embolization of the superior and inferior thyroid arteries using glue was done. During continuing treatment in ICU, neck hematoma was surgically revised multiple times. However, patient died in 8 days due to hyperkalemia.

Discussion: Traumatic neck hematomas, caused by blunt force are life-threatening, involving thyroid gland, thyroid and carotid arteries. Hematomas in this area cause significant swelling and airway obstruction. When associated with arterial injury, complications like persistent bleeding and pressure on the trachea and larynx increase (1). Fiberoptic intubation is commonly used for difficult airways. However, its application in massive hematomas is rare (2). Awake fiberoptic intubation was chosen to prevent further airway trauma and ensure safe intubation despite significant displacement of airway structures.

References:

- 1. Evans C, et al. Management of Major Vascular Injuries: Neck, Extremities, and Other Things that Bleed.2018.
- 2. Kani K, et al. Awake Fiberoptic Tracheal Intubation in a Patient With Traumatic Retropharyngeal Hematoma. 2023.

Learning Points: Traumatic neck hematomas are rare and can lead to severe airway or vascular complications, requiring prompt and precise management. Awake fiberoptic intubation is crucial for securing the airway.

42AP12-7

Critical airway management - could videolaryngoscope be the first option in awake intubation?

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Background and Goal of Study: The fundamental responsibility of the anesthesiologist is to ensure airway and adequate gas exchange. Airway anatomy with or without pathological abnormalities can progress rapidly to a life-threatening airway obstruction and catastrophic anoxic brain injury. We performed awake tracheal intubation (ATI) with the videolaryngoscope D-blade (C-MAC™) as the gold standard in patients with distorted airway.

Materials and Methods: A retrospective cohort study centered on patients who underwent for emergency airway management between 10/10.2023 and 10.10.2024. C-MAC was the first-choice technique for awake tracheal intubation for Urgent and Emergency difficult ventilation and difficult intubation.

Inclusion criteria were adult patients with acute dyspnea due to infection or pathological masses of the upper airway leading to change of the physiological anatomy of the area.

Exclusion criteria were children, patients patients unable to execute commands.

Our decision to perform a critical awake intubation by VL, has 3 bases: applying high-flow nasal O2, topicalization with lidocaine and sedation with or without dexmedetomidine/remifentanyl.

Primary outcome was the success rate of VL as plan A during Awake intubation. Secondary outcomes were duration of tracheal intubation, level of SPO₃, incidence of intraoperative complica-

Results and Discussion: The study included 56 patients, the mean patient age was 52,1 years (range 27-68 years), the mean BMI 36,4 kg/m² ± 5.75. 11 patients with Ludwig's angina and 24 with progressive cervical edema from infections of the maxillofacial area, underwent for urgent surgical drainage. 88% of them had limited mouth opening <1,5cm. We used wooden spatulas to increase mouth opening >1,5 cm, so that D-blade could be placed in patients' mouth. 21 patients with history of supraglottic/glottic tumors or epglottitis, with stridor and respiratory distress, presented in operating room for emergency management of difficult airway with anticipated difficult tracheostomy. We successfully performed AT in 54 patients. Endotracheal

intubation was unsuccessful in 2 patients due to the tumor covering part of the glottic area. Extubation was successful in all patients but one, who presented severe bronchospasm and Acute Lung Injury (ALI).

Conclusion(s): We believe that VL is very successful in critical airway management in patients with distorted upper airway anatomy due to tumor or infection with ultimately improved intubation conditions.

Unforeseen anaphylactic reaction in a young healthy patient undergoing arthroscopic meniscectomy: a case report

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Background: This case details an unusual incident of anaphylactic shock in a healthy 25-year-old woman undergoing arthroscopic meniscectomy. Remarkably, the patient had no prior history of diseases or allergies. The preoperative sciatic and saphenous nerve blocks with 80 mg of 0.2% Ropivacaine, accompanied by light sedation using midazolam (2 mg) and fentanyl (50 mcg), initiated a cascade of unexpected events during the subsequent general anesthesia induction.

Case report: Post-peripheral nerve blocks, general anesthesia induction with 50 mcg of fentanyl and 150 mg of propofol resulted in rapid and profound desaturation, indicating severe bronchospasm. She was intubated and was administered 100 mg of ketamine, 2g of magnesium sulfate, 200 mg of hydrocortisone and 30 mg of rocuronium intravenously, 300 mcg of adrenaline intramuscular, 400 mcg of salbutamol and sevoflurane inhaled, with recovery of the vital signs. Despite the presence of ST depression observed on EKG monitoring during the event, both the 12-lead EKG and laboratory assessments revealed no evidence of myocardial ischemia in the patient. Postoperatively, successful extubation in the operating room and subsequent transfer to the post-anesthetic care unit revealed no neurological deficits and a positive recovery. Hypersensitivity to midazolam, propofol, and fentanyl was identified as the cause of the anaphylactic reaction in imunoalergology consult.

Discussion: This case is singular because it not only underscores the rarity and severity of a severe allergic reaction to a combination of commonly used anesthetics as it will demand meticulous preoperative planning, necessitating a specialized anesthetic approach for future elective surgeries and potential emergent scenarios that this patient may require in the future. Several cases of anaphylaxis to propofol or fentanyl have been described.^{1,2} Anesthesiologists must acknowledge the unpredictable nature of such events and respond promptly with tailored interventions. This case serves as a compelling reminder of the imperative for ongoing education and preparedness among anesthesiologists and a permanent high degree of suspicion for the occurrence of these cases.

References:

1. Baldo et al. (2017): Anaphylaxis to propofol: a case series, BJA 2. Guttormsen et al. (2001): Fentanyl-induced anaphylaxis: clinical characteristics and r.o.l., AAC

Learning points: Life threatening bronchospasm to propofol and fentanyl, effective crisis management

42AP12-9

Anaesthetic management of maxillary tumour resection in a patient with Hereditary Angioedema: a case report

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Background: Hereditary Angioedema (HAE) is a rare disorder characterized by potentially life-threatening swelling episodes, often linked to C1 inhibitor deficiency or dysfunction. Surgical procedures, particularly in the oral cavity, pose significant risks due to potential airway complications.

Case report: A 18-year-old female, diagnosed with HAE presented with persistent right maxillary swelling of size 3.1x3.0x2.0cm .The results of the pre-operative laboratory investigation were within normal limits, except for C1-INH level of 0.04(0.21-0.39) & C-4 was 7.8 (10-40mh/dL) with low function. The immunologist advised her Tablet Danzol 100mg and recommended the administration of 1500 units of C1-INH before the surgical procedure and advised to administer an additional 1000 units of C1-INH postoperatively if any symptoms of angioedema were to manifest. One hour before arrival in the operating room, she received intravenous administration of two vials (500mg each) of plasma-derived C1-INH concentrate. The OT was prepared to ensure the availability of emergency airway equipments, including a tracheostomy set. The patient was induced with Propofol 120mg, Fentanyl 50mcg,cis-atracurium 10mg and hydrocortisone was given prior to intubation. The patient was intubated gently using videolaryngoscope, 6 size ET tube was placed nasally after adequate lubrication and pilot balloon of the tube was inflated with the lowest pressure that prevents leakage. Anaesthesia was maintained using oxygen, air and sevoflurane. Compression trauma was tried to be minimized by using proper padding and throat pack was placed. The tumour was excised without any perioperative complications. The patient was extubated without straining after recurarization. The patient was transferred to the intensive care unit for postoperative follow-up.

Discussion: Preoperative treatment is recommended particularly before dental interventions, endotracheal intubation, and endoscopy due to the risk of angioedema development and lifethreatening larynx oedema. We paid attention to face mask not to cause a high compression, to apply endotracheal intubation gently, to use an appropriate sized tube, and not to inflate the pilot balloon of the tube more than necessary.

Learning points: Adequate preoperative assessment and planning ,especially C1-INH concentrate administration, danazol therapy, and meticulous OT preparation to mitigate angioedema risks is vital for the successful completion of this surgery.

Management of airway using videolaryngoscope in a child with Axenfeld-Rieger syndrome: a case report

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Background: Axenfeld Rieger Syndrome (ARS) is an autosomal dominant disease with variable morphology characterized by malformations of the eye with dental, cardiac and craniofacial defects(1). Glaucoma occurs in 50% of ARS cases. These patients will require surgical interventions to prevent permanent blindness. This syndrome is associated with difficult intubation due to facial anomalies and maxillary hypoplasia.

Case Report: We report the case of a 7 year-old female child who required general anesthesia for glaucoma surgery of the left eye. Written informed consent was obtained from her parents for publication. An extraoral examination revealed hypertelorism, a broad nasal bridge and mandibular retrognathia. Mallampati classification, mouth opening and thyromental distance were preoperatively evaluated. A mallampati score of 3 and a short thyromental distance of < 6.0 cm were considered to represent difficult intubation. Anesthesia was induced with sevoflurane in oxygen via a face mask. Neuromuscular relaxation was achieved with rocuronium bromide (0.6 mg/kg). The patient was intubated on the first attempt with a 5 mm ID endotracheal tube using a videolaryngoscope -Hugemed VL4R 4" VideoLaryngoscope (Shenzhen HugeMed Medical Technical Development Co., Ltd- China) (Figure 1). The surgery, involving the placement of an Ahmed glaucoma valve implant, lasted approximately 45 minutes and was uneventful.

Discussion: Preoperative identification of a difficult airway is crucial in patients with ARS. The Difficult Airway Society recommends videolaryngoscopy as an alternative to direct laryngoscopy in patients with difficult airways. Videolaryngoscope can provide better laryngeal exposure than conventional direct laryngoscope and reduces the incidence of failed attempts and complications such as hypoxemia and airway trauma.

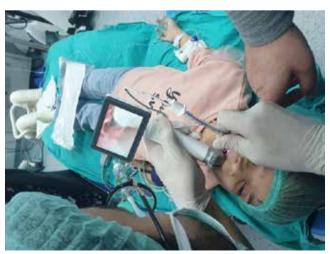


Figure 1. Intubation with videolaryngoscope.

Reference:

1. Baduni N. Anaesthetic challenges in a patient with Axenfeld Rieger Syndrome, Anesth Essays Res. 2012 Jan-Jun: 6(1): 108-109. Learning points: Videolaryngoscopes reduce the risk of failed intubation attempts and major complications in children compared to direct laryngoscopes.

42AP12-11

Management of critical neonatal airway obstruction

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Background: Congenital airway abnormalities occur at various anatomic levels and their presentation is influenced by the severity and level of obstruction. The prevalence ranges between 0.2 and 1 in 10,000 live births.1

Case report: A 32 year-old, primigravid, at 37 weeks + 2 days had an uneventful eutocic delivery performed by the obstetric nurses. The antenatal ultrasound revealed a lombar scoliosis otherwise the pregnancy was uncomplicated. At delivery, the female newborn was gasping. Positive pressure ventilation (PPV) was administered immediately by the obstetric nurses and the neonatal team was called. PPV failed to adequately produce chest movement and direct laryngoscopy resulted in a Cormack-Lehane grade 1 but the endotracheal tube was unable to progress beyond the vocal cords. A second attempt was performed with videolaryngoscope but the problem persevere. Ventilation via a supraglottic airway device also failed. The anesthesiology and ENT teams were called as the several attempts of tracheal intubation were unsuccessful and oxygenation and ventilation was impossible. The heart rate dropped bellow 60/min and chest compressions were started. ENT team tried to perform percutaneous needle and surgical cricothyroidotomy that again, failed. Finally, a emergent surgical tracheostomy was successfully performed. Adrenaline was administered via ETT, followed by insertion of umbilical venous catheter. After adequate ventilation and oxygenation the heart rate arise above 100. Following resuscitation and stabilization, the newborn was transferred to a central pediatric hospital. Further investigation revealed multiple congenital malformations, including laryngeal web causing complete obstruction of the upper airway.

Discussion: When intubation fails and oxygenation and ventilation are severely impaired or impossible, surgical tracheostomy represents the preferred emergency access to the trachea in neonates and infants.2

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Learning points: Neonatal airway obstruction requires an experienced multidisciplinary team.

Fluid and Blood Management: Transfusion, Haemostasis, Thrombosis,...

43AP01-1

Adjunctive fresh frozen plasma versus adjunctive cryoprecipitate in cardiac surgery patients receiving platelets for perioperative bleeding

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Background and Goal of Study: In cardiac surgery patients receiving platelets for perioperative bleeding, we aimed to assess the relative association of adjunctive fresh frozen plasma (FFP) or adjunctive cryoprecipitate with morbidity and mortality.

Materials and Methods: This was a retrospective cohort study using data from the Australian and New Zealand Society of Cardiac and Thoracic Surgeons National Cardiac Surgery Database. We included platelet-transfused cardiac surgery patients treated with either FFP or cryoprecipitate from January 1, 2005, to December 31, 2021, across 58 Australian and New Zealand centers. We completed inverse probability of treatment weighting with entropy balancing to compare the relative risks of operative mortality (defined as mortality within 30 days of surgery or during initial hospital admission), 1-year mortality, and other clinical outcomes. We also assessed year-by-year transfusion trends.

Results and Discussion: We studied 12,889 platelet-transfused patients. Of these, 8,764 received adjunctive FFP and 4,125 received adjunctive cryoprecipitate, with cryoprecipitate increasing over time relative to FFP. After entropy balancing, compared with adjunctive cryoprecipitate, adjunctive FFP transfusion was associated with increased operative mortality (relative risk (RR): 1.49; 95% CI: 1.24, 1.79; p<0.001); 1-year mortality (RR: 1.37; 95% CI: 1.13, 1.66; p=0.001); increased risk of acute kidney injury (RR: 1.16; 95% Cl: 1.02, 1.33; p=0.024); all-cause infection (RR: 1.14; 95% Cl: 1.02, 1.29: p=0.026), and intensive care length of stay in days (adjusted mean difference: 8.02; 95% CI: 1.72, 14.33; p=0.013).

Conclusion(s): In cardiac surgery patients receiving platelets for perioperative bleeding, compared with adjunctive cryoprecipitate, adjunctive FFP was independently associated with greater morbidity and mortality. These hypothesis-generating findings warrant further prospective investigation.

Acknowledgements: We would like to thank Prof Julian A Smith, Prof Christopher M. Reid and Dr Jenni Williams-Spence for their support via the Australian & New Zealand Society of Cardiac & Thoracic Surgeons Cardiac Surgery Database Program.

43AP01-2

A meta-analysis for the efficacy and safety of intravenous ferric carboxymaltose vs. iron sucrose for iron deficiency anemia in obstetric and gynecologic patients

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Background and Goal of Study: Iron deficiency anemia (IDA) is very common among obstetric and gynecologic patients. This systematic review aimed to assess randomized controlled trials (RCTs) regarding the comparative efficacy and safety of most commonly used intravenous (IV) iron preparations such as ferric carboxymaltose (FCM) and iron sucrose (IS) in the treatment of IDA among obstetric and gynecologic patients.

Materials and Methods: We systematically searched PubMed, Embase, Cochrane, and Google Scholar for eligible RCTs comparing IV iron replacement using FCM or IS. Primary outcomes were the efficacy of FCM and IS as assessed by comparing serum hemoglobin (Hb) and ferritin levels before and after iron replacement. Secondary outcomes were the safety of FCM and IS assessed by comparing the incidences of adverse events during iron replacement. Meta-analysis was performed with RevMan 5.3. We also performed a subgroup analysis of post-treatment Hb and ferritin values according to the classification of study patients (obstetric, gynecologic, and obstetric and gynecologic).

Results and Discussion: We identified 9 RCTs with 910 patients (FCM group, n=456; IS group, n=454). Before IV FCM or IS replacement, the FCM and IS groups had similar baseline Hb and ferritin levels (Hb: MD, 0.04 g/dl; I2=0%; P=0.48 vs ferritin: MD, -0.42 ng/ml; I2=45%; P=0.49). After IV FCM or IS replacement, Hb (MD, 0.67; 95% CI, 0.25 to 1.08; I2=92%; P=0.002) and ferritin (MD, 24.41; 95% CI, 12.06 to 36.76; I2=75%; P=0.0001) levels were higher in the FCM group than the IS group. In all subgroup, post-replacement Hb and ferritin were also higher in the FCM group than the IS group. The FCM group had a lower incidence of adverse events than did the IS group (RR, 0.53; 95% CI, 0.35 to 0.80; I^2 =0%; P=0.003)(Fig. 2). No serious adverse events were reported in any groups.

Conclusion(s): FCM therapy showed better efficacy in increasing Hb and ferritin levels, as well as a more favorable safety profile with fewer adverse events than IS therapy in IDA among obstetric and gynecologic patients. There are no published human data on developmental adverse outcomes associated with the use of IV FCM or IS. There is a need for caution regarding the use of IV iron replacement for the treatment of IDA in the first trimester of pregnancy; however, IV iron replacement may be recommended in the second and third trimesters.

Reference:

Aksan A,et al. Aliment Pharmacol Ther. 2017; 45:1303-18.

43AP01-3

miR-155 regulates antibody-mediated TRALI via mast cell activation

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Background and Goal of Study: Transfusion-related acute lung injury (TRALI) is one of the leading causes of transfusion-related deaths. miR-155 and mast cells are involved in acute lung injury. This study will verify through animal experiments that: downregulating miR-155 can suppress TRALI via repressing mast cell activation.

Materials and Methods: 9-week-old male BALB/c mice were used as experimental animals. Low-dose lipopolysaccharide (LPS) (0.1 mg/kg) was administered to mice intraperitoneally 24 hours before the experiment. On the day of the experiment, 34-1-2s (1.5 mg/kg) were injected into the tail vein. After 2 hours, isolate the left lung and collect bronchoalveolar lavage fluid (BALF). Finally, collect the lower lobe, middle lobe, and upper lobe of the right lung. Enzyme-linked immunosorbent assay (ELISA) and quantitative real-time PCR (qPCR) were used to evaluate interleukin-6 (IL-6), IL-17A, tumor necrosis factor [] (TNF-[]), and IL-1[] expression. The myeloperoxidase (MPO) activity was measured by ELISA. The BCA method was used to evaluate the total protein in BALF. Lung tissues were subjected to hematoxylin and eosin stain (H&E), and lung injury score was determined based on the evaluation system of the American Thoracic Association.

Results and Discussion: Here, anti-major histocompatibility complex class I antibodies (34-1-2s) were used to establish "two-hit" TRALI mouse models. In TRALI models, we found that miR-155 was down-regulated in plasma and lung tissues. Besides, mast cells were activated and some inflammation factors (e.g. tumor necrosis factor (TNF)-[], interleukin (IL)-1[], IL-17A, and IL-6) were increased. Subsequently, our results suggested that reducing miR-155 repressed MPO activity, decreased lung injury scores, wet-to-dry ratios, and BALF protein contents, and declined TNFand IL-6 expression in TRALI. Besides, miR-155 inhibition diminished the expression of mast cell activation biomarkers prostaglandin-2 and tryptase-1, indicating that mast cell activation was repressed in TRALI. Furthermore, targeting activated mast cells decreased MPO activity, lung injury scores, wet-to-dry ratios, and BALF protein contents, and reduced TNF-□ and IL-6 expression in antibody-mediated TRALI mouse models.

Conclusion(s): These findings suggested that suppressing miR-155 restrains lung injury and inflammation via inhibiting mast cell activation in antibody-mediated TRALI.

43AP01-4

Thromboelastometry-guided hemostatic therapy for hemorrhagic shock in a case of massive hemorrhage in an oncosurgical patient: a case report

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Background: Hemorrhagic shock is a medical emergency that often complicates Onco- surgery and can lead to death. Thromboelastometry has been considered an effective tool for bleeding management in critically ill patients. Thromboelastometry can guide transfusion therapy guickly.

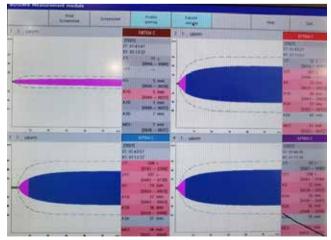
Case Report: 58-year-old a known case of gastric malignancy reported with giddiness and syncope. He was hypotensive (NIBP 70/40) with HR of 125/min.

Ultrasound revealed blood in the abdomen. He was intubated, and a massive transfusion protocol was activated. His laboratory tests revealed severe anemia (hemoglobin 4.4 mg/dL), metabolic acidosis (bicarbonate 10 mEq/L, pH 7.11), hypofibrinogenemia (70 mg/dL), international nationalized ratio 1.95, and lactic acidosis. He was transfused 10 units of PRBC,8 units of FFP, 8 units of Cryoprecipitate and 12 liters of crystalloids in the intensive care unit. His hemodynamics were supported by Noradrenaline and Vasopressin (IABP 85/45).

It was decided to take him up to the hybrid OT for angiography (which failed to stop the bleeding) exploration. On arrival, a ROTEM was done in the OT which showed hyperfibrinolysis with Hypocoagulability.

We gave 1000 mg Tranexamic along with 6 PRBC, 5 Cryoprecipitate, 6 FFP, Platelets, and 4 liters of crystalloids. The total intraoperative blood loss was 5.5 liters. The tumor mass has eroded the gastroduodenal artery.

"Preoperative ROTEM"



A repeat ROTEM done 2 hours (After the majority of transfusion products were given)showed normal thromboelastography.

"Post Resuscitation ROTEM"



Discussion: Thromboelastometry may be considered a useful, feasible, and safe tool to monitor and manage coagulopathy in patients with hemorrhagic shock. ROTEM it has the potential benefit of allowing rapid diagnosis, goal-directed therapy with hemostatic drugs, and coagulation factor concentrates.

43AP01-5

Association of transfusion-free management using intraoperative autologous blood donation (IABD) with postoperative acute kidney injury (AKI) risk in OPCAB surgery

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Background: In cardiac surgery, recent studies have reported an association between blood transfusions and an increased risk of AKI. In this retrospective study, we compared the incidence of postoperative AKI between transfusion-free management using IABD and intraoperative allogeneic blood transfusion (ABT) in OPCAB cardiac surgery

Methods: In the previous hospital, among OPCAB surgeries performed from August 2017 to November 2022 (n=223), patients were excluded from the study if they presented with preoperative cardiogenic shock, were on IABP support, were receiving dialysis, had a preoperative serum creatinine level ≥1.25, or received intraoperative infusion of only albumin solution or low-molecularweight dextran (HES). After anesthesia induction, ABD was performed in patients with a hemoglobin level of ≥13 before heparin administration, stored at room temperature with gentle agitation, and retransfused intraoperatively after protamine administration. Group A (GA) included patients who underwent 'IABD without ABT,' while Group B (GB) included those who received 'ABT'. In all cases, intraoperative blood salvage with a cell saver was used, and neither tranexamic acid nor diuretics were administered intraoperatively. Postoperative outcomes, including postoperative AKI classified according to the KDIGO criteria and ICU stay duration, were evaluated and compared. Fisher's exact test and the Mann-Whitney U test were used for intergroup comparisons, with statistical significance set at P<0.05.

Results: A total of 135 cases were included (Group A/B: 68/67 cases), with AKI observed in 21 patients (15.6%). Although there was no significant difference in preoperative serum creatinine levels between the two groups, postoperative AKI incidence based on the KDIGO classification was significantly higher in GB compared to GA (p = 0.0466). In particular, in KDIGO stage 2-3, GA had no cases, while multiple cases were observed in GB (n=4). There was no statistically significant difference in postoperative ICU stay duration (p = 0.0658).

Conclusions: In this study, the risk of developing postoperative AKI in OPCAB surgery was observed even in patients with normal preoperative serum creatinine levels.

Additionally, transfusion-free management with IABD was suggested to significantly reduce the risk of postoperative AKI compared to ABT.

43AP01-6

Optimal administration of tranexamic acid for non-emergency cardiac surgery: a systematic review and network meta-analysis

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Background and Goal of Study: There is ongoing discussion on the best way to provide tranexamic acid (TA) and the appropriate dosing regimens for cardiac surgery. We conduct this network meta-analysis to evaluate the efficacy and safety of various TA delivery methods in cardiac surgery.

Materials and Methods: We searched PubMed, Embase, Cochrane Central Register of Controlled Trials, Scopus and Web of Science from inception to July 11, 2024. We included randomized controlled trials evaluated the hemostatic effects of TA in cardiac surgery. Two authors independently selected studies and extracted data. The quality of trials was assessed using the Cochrane risk of bias tool. Our primary outcomes were blood transfusion needs and postoperative seizures. We estimated summary odds ratios and mean differences using pairwise and network meta-analysis.

Results and Discussion: A total of 17909 participants from 54 studies included in this study. Except combination administration, all strategies discussed in this article significantly reduced the transfusion risk. The risk of transfusion was further decreased by high dose TA compared to low dose. When compared to intravenous administration, local administration may raise the risk of blood transfusion in cardiac surgery. High dose TA can dramatically raise the risk of postoperative seizure.

Intervention	Definition
High-dose TA	total dose regimens greater than 80mg/kg or 30mg/kg+10mg/kg/h
Medium-dose TA	total dose regimens greater than 50mg/kg but less than 80mg/kg
Low-dose TA	total dose regimens less than 50mg/kg or 10mg/kg+2mg/kg/h
Topical TA	tranexamic acid diluted in normal saline and poured into mediastinal cavity before closing the chest
Combined TA	additional intrapericardial application of tranexamic acid to the intravenous application

Table. Definitions of interventions included in this study.

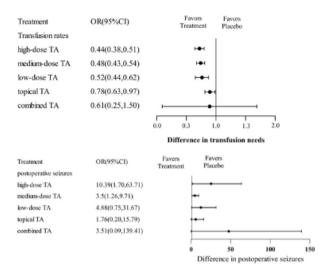


Figure. Forest plot of network meta-analysis results for primary outcomes

Conclusion(s): In cardiac surgery, medium-dose intravenous infusion was the most preferable delivery method which was as effective as high-dose regimen in reducing transfusion rate without increasing the risk of seizure. Topical compared with intravenous infusion was associated with a higher rate of blood transfusions. Larger clinical trials are required to validate these results.

43AP01-7

Plethysmography Variability Index (PVI) versus Pulse Pressure Variation (PPV) as a measure of fluid responsiveness as measured by end-expiratory occlusion test in patients undergoing major surgery

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Background and Goal of Study: Fluid therapy is an integral part of resuscitation as well as the cornerstone in the enhanced recovery after surgery (ERAS) protocol. Plethysmography variability index (PVI) provides a continuous non-invasive measure of the relative variability of the photo-plethysmograph during respiratory cycles. It may be used as a dynamic indicator of fluid responsiveness in mechanically ventilated patients. The end expiratory occlusion test (EEOT) is another method of assessing fluid responsiveness. The pulse pressure variation (PPV) is another index used commonly to assess fluid responsiveness. However, it requires the presence of an intra-arterial line.

The hypothesis of the study was that PVI provides comparable indices of fluid responsiveness as compared to the PPV in patients undergoing major elective surgical procedures in our institution. Fluid responsiveness was assessed using the EEOT at the 5 & 10 minute intervals.

Materials and Methods: This was a pilot prospective study involving 20 patients scheduled for major elective surgery in Khoo Teck Puat Hospital, Singapore.

The study was approved by the Institutional Review Board (IRB) (2022/00890) and written consent was obtained from all subjects. Patients under General Anaesthesia were mechanically

ventilated with a PBW of 8mls/kg. A baseline reading (R1) of PPV & PVI was undertaken. This was followed by PPV & PVI readings at 5 minutes (R2) and 10 minutes (R3) after an EEOT was performed.

Results and Discussion: The results can be divided into R1, R2 and R3 differences. 18 readings were taken for R1 and R2 differences, and 17 for R3 difference. There was variability amongst the differences in readings amongst R1, R2 and R3, with the greatest variability coming with R1 differences ranging from 0 to 41. If a difference of >10 was taken as an outlier, the number of outliers were 5,4 and 3 respectively for R1, R2 and R3 differences. The majority of readings had differences under 10 points. From an analysis of the readings, it seems that PVI readings had the greatest variability and this tended to occur with the R1 difference during the initial baseline measurements. PVI readings seem to be affected by extrinsic causes resulting in multiple outliers.

Conclusion: There may be some utility in using the PVI values as a surrogate for PPV values and fluid status. Further studies with use of a cardiac output monitor would be required to verify this association.

43AP01-8

The role of endogenous heparinization as a perioperative predictor for postoperative admission to the intensive care unit: a pilot study

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Background and Goal of Study: The phenomenon of endogenous heparinization has been associated with the degradation of the endothelial glycocalyx, a complex layer of proteoglycans and glycoproteins lining the intraluminal surface of blood vessels, with a crucial physiological role. Its degradation products exhibit anticoagulant properties that can be detected through thromboelastography/thromboelastometry methods. We hypothesized that the presence EG degradation and also the degree of it, could function as a perioperative marker of the patients' physiological status, specifically the need for postoperative ICU admission

Materials and Methods: 30 patients were enrolled (mean age: 65.43 years, sd: 10.43, ASA II: 53%, BMI: mean: 27.55, sd: 5.29, male sex: 53%), scheduled for elective or emergency surgery, the need for preoperative ICU bed reservation was assessed. The decision was based on the patients' physiological status (ASA) and the nature of the surgical procedure (SRS) during the pre-anesthetic evaluation. Two ROTEM tests (Intem/Heptem) were performed: one at the beginning of the surgery during the placement of the A-line, and at the end of the surgery during the closure of the surgical wound. Statistical analysis was conducted to investigate potential correlations between the Intem/Heptem ratios and ICU admission, using Mann-Witney Test and Multivariate Logistic Regression Analysis including multiple pre and intraoperative parameters.

Results and Discussion: The Mann-Witney Test indicated that the postoperative Intem/Heptem ratio showed a strong positive correlation with the patient's ICU admission (U = 25.000, Z = -2.880, p = 0.004). The percentage difference of the ratios also approached significance (p = 0.057), indicating a potential association.From the Logistic Regression analysis the post ratio

emerged as a key predictor of the outcome, maintaining significance through multiple regression steps (p = 0.015 in the final model) The model demonstrated good predictive power with an overall classification accuracy of 88.9%. The preoperative ratio itself did not show a significant correlation. The findings suggest that the detection of endogenous heparinization at the end of surgery, as indicated by higher Intem/Heptem ratio values, is associated with the need for ICU admission room.

Conclusion(s): The results underscore the importance of evaluating the phenomenon of endogenous heparinization as a prognostic marker for postoperative admission to the ICU

43AP01-9

Serum exosomes induce transfusion-related acute lung injury via JNK signaling pathway

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Background and Goal of Study: Transfusion-related acute lung injury (TRALI) is one of the leading causes of transfusion-related deaths. c-Jun N-terminal kinase (JNK) is involved in acute lung injury. This study will verify that: serum exosomes induce TRALI via JNK signaling pathway.

Materials and Methods: Exosomes were isolated from normal mouse serum. Serum exosomes were identified by nanoparticle tracking analysis (NTA), transmission electron microscopy (TEM), and western blot (WB). 72 hours before the experiment, JNK inhibitors were injected into the tail vein. Low-dose lipopolysaccharide (0.1 mg/kg) was administered to mice intraperitoneally 24 hours before the experiment. On the day of the experiment, serum exosomes were injected into the tail vein. After 2 hours, isolate the left lung and collect bronchoalveolar lavage fluid (BALF). Finally, collect the lower lobe, middle lobe, and upper lobe of the right lung. Enzyme-linked immunosorbent assay (ELISA) were used to evaluate interleukin-6 (IL-6), IL-17A, tumor necrosis factor α (TNF- α), and IL-1 β expression. The myeloperoxidase (MPO) activity was measured by ELISA. The BCA method was used to evaluate the total protein in BALF. Lung tissues were subjected to hematoxylin and eosin stain (H&E), and lung injury score was determined based on the evaluation system of the American Thoracic Association. CD9, CD63, total and phosphorylated JNK were measured by WB analysis.

Results and Discussion: The results of TEM, NTA, and WB all indicated that the extractions after ultracentrifugation were mainly exosomes. Serum exosomes increased MPO activity, total protein of BALF, lung wet/dry ratios, and lung injury score in mouse lung tissue, indicating that serum exosomes successfully induced TRALI in mice. Serum exosomes raised expression of TNF-α, IL-6, IL-1\u00e3, and IL-17A. Besides, serum exosomes significantly augmented the phosphorylation levels of JNK, and JNK inhibitors significantly inhibited the JNK signaling pathway. JNK inhibitors significantly reduced MPO activity, total BALF protein concentration, lung wet/dry ratio, and lung injury score. These suggested that JNK inhibitors suppressed TRALI. JNK inhibitors also reduce expression of TNF-α, IL-6, IL-1β, and IL-17A.

Conclusion(s): Serum exosomes induced TRALI via the JNK signaling pathway, promoting the release of inflammatory factors. Suppressing the JNK signaling pathway reduces inflammatory response levels, thereby alleviating TRALI.

43AP01-10

Assessing the impact of routine intervention for preoperative hyponatremia on post-operative outcomes

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Background and Goal of Study: Preoperative hyponatremia is associated with poorer outcomes, including increased mortality, ICU admissions, prolonged hospital stays, and readmissions. It is unclear if preoperative hyponatremia is a causal factor for poorer outcomes or simply reflects underlying pathology. Similarly, the effect of intervening to correct preoperative hyponatremia has not been studied before.

This study evaluates the impact of an institutional protocol for managing preoperative hyponatremia with an intervention serum sodium threshold of ≥130 mmol/L on perioperative outcomes using a regression discontinuity design (RDD).

Materials and Methods: We analyzed data from the SingHealth Perioperative and Anesthesia Subject Area Registry (PASAR), including adult surgical patients from 2013 to 2022.

Outcomes evaluated included 30-day mortality, 1-year mortality, ICU admissions, length of stay (LOS), and rapid postoperative sodium correction (defined as greater than 8mmol/L in 24h). RDD models (sharp, kink, triangular kernel) were applied to identify treatment effects at the sodium threshold.

Subgroup analyses included patients with cardiac disease, chronic kidney disease, high operative risk, and emergent procedures **Results and Discussion:** Among 174,792 patients, no significant discontinuity was observed at the sodium threshold for 30-day mortality, ICU admissions, or LOS. However, a significant discontinuity was found for 1-year mortality (Treatment effect = 0.081, p=0.010), with the same discontinuity also observed in subgroups with cardiac disease, chronic kidney disease, or emergent procedures.

Unsurprisingly, lower preoperative sodium (<130 mmol/L) was strongly associated with rapid postoperative sodium correction (Odds ratio = 1.190 per mmol/L decrease, p<0.001). These findings suggest that protocolized sodium correction does not significantly improve short-term outcomes but may influence longerterm mortality.

We also posit that protocolized management of sodium could have unintended consequences such as operative delays, although this was not evaluated in this study.

Conclusion(s): Standardized sodium correction protocols may not significantly improve immediate outcomes but could affect longer-term mortality in specific subgroups. Further studies are needed to assess the role of hyponatremia etiology and patient volume status to refine perioperative management strategies.

43AP01-11

Unexpected severe coagulation disorder in a patient undergoing elective cardiac surgery managed with rotational thromboelastometry - a case report

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Background: Consumption coagulopathy is common in on-pump cardiac surgery. Rotational thromboelastometry (ROTEM) is often utilized to assess the extent of the disorder. In most cases, its results correlate with the preoperative coagulation panel.

We present a case of a patient with a coagulation disorder despite normal preoperative international normalised ratio (INR) and activated thromboplastin time (PTT).

Case Report: A 57-year-old male patient was scheduled for an aortic valve replacement. Preoperatively, the patient exhibited a normal INR of 0.98 and an PTT of 24 s. His medical history included an intensive care unit stay, complicated with secondary sclerosing cholangitis. On admission, transaminases were within normal ranges. GGT was elevated at 501 IU/I (normal range: < 60 IU/I).

Intraoperatively, following the on-pump time of 75 minutes and heparin reversal, a diffuse microvascular bleeding was diagnosed. ROTEM was performed, the results are presented in Table 1. 2500 IU of 4-factor prothrombin complex concentrate and 4 units of fresh frozen plasma were administered. The follow-up ROTEM showed sufficient coagulation, and the microvascular bleeding ceased.

	FIBTE	M-CT	FIBTE	M-A5	EXTE	м-ст	EXTEN	1-A5	HEPTE	м-ст	HEPTE	M-A5
	NR		NR		NR		NR		NR		NR	
T1	<84 s	233	>5 mm	14	<80 s	227	>32 mm	29	<211 s	365	>34 mm	NA
T2	<84 s	83	>5 mm	17	<80 s	94	>32 mm	57	<211 s	206	>34 mm	51

Table 1. Results of the first (T1) and the second (T2) ROTEM. NR: normal range.

Discussion: In this case, we observed a clinical situation contrary to the ones seen in most patients with chronic liver disease, who tend to have prolonged INR and PTT, but normal ROTEM. It is thought that viscoelastic tests better reflect the in vivo situation than traditional laboratory tests, which do not consider the rebalancing of the coagulation system.

The appropriate coagulation in patients with liver disease depends on the equilibrium between procoagulant and anticoagulant factors, such as protein C[1].

Hemodilution during on-pump surgery further reduces the factor levels. However, the activity of protein C has been shown to increase following aortic declamping[2].

Our hypothesis is that the imbalance of these reactions resulted in a shift towards anticoagulant activity.

References:

- 1. Northup PG, Caldwell SH. Coagulation in Liver Disease: A Guide for the Clinician. Clinical Gastroenterology and Hepatology 2013; 11: 1064-74.
- 2. Petäjä J, Pesonen E, Fernández JA, Vento AE, Rämö OJ, Griffin JH. Cardiopulmonary bypass and activation of antithrombotic plasma protein C. The Journal of Thoracic and Cardiovascular Surgery 1999; 118: 422-9; discussion 429-431.

Learning Points: The use of rotational thromboelastometry enables the individualisation of therapy by atypical disease manifes-

43AP02-1

Management of patient with Sotos syndrome and factor VIII deficiency undergoing scoliosis surgery

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Background: Sotos syndrome is rare genetic disorder characterised by a distinctive facial appearance, cognitive impairment, overgrowth. Hemophilia A, factor VIII deficiency, is an X-linked recessive disorder presenting with increased risks of perioperative bleeding.

Case Report: A 11 years old boy weighing 41 kg, diagnosed Sotos syndrome (characteristic facial appearance, mild cognitive impairment, mitral valve prolapsus, aortic insufficiency), factor VIII deficiency was scheduled for posterior instrumentation surgery. Baseline laboratory results showed hemoglobin (Hb) 12.9 g/dl, a prothrombin time (PT) of 13,9s, an activated partial thromboplastin time of 45,3 s, and a platelet count of 192,000/mm³. His preoperative factor VIII activity was <20% of normal. The patient received factor VIII therapy at 40 U/kg before surgery. In operation we used 20 mg/kg tranexamic acid bolus and a 10 mg/kg infusion. We used TİVA (propofol, remifentanil) for anesthesia and one dose rocuronium before intubation. There was 1000ml bleeding during operation, we used 2 packed red cells,1 fresh frozen plasma. The patient was administered 1000 u factor VIII intraoperatively (Hb 11,6). Postoperative 0. Day bleeding was 200ml (hemovac drain), 1. Day bleeding was 290ml and we applied 1000IU factor VIII and 1paced red cells. Postoperative 3. Day the patient was discharged.

Discussion: Hemophilia A is a rare disorder caused by autoantibodies directed against clotting and tend to present with hemorrhage. The incidence of Hemophilia A has been estimated at 0.2-1.0 case per 1 million persons, but this may be underestimated because of difficulty in making the diagnosis ([1]).

Anti-fibrinolytic drugs are widely used in hemophilic patients to reduce blood loss in a variety of bleeding conditions, including severe trauma and surgery [2].

Most used treatment and prophylaxis before major bleeding operations is still factor replacement.

References:

- 1. Morrison, A. and C. Ludlam, Acquired haemophilia and its management. British Journal of Haematology, 1995. 89(2): p. 231-236.
- 2. Janbain, M., et al., Hemostatic effect of tranexamic acid combined with factor VIII concentrate in prophylactic setting in severe hemophilia A: A preclinical study. Journal of Thrombosis and Haemostasis, 2020. 18(3): p. 584-592.

Learning Points: In this case we show our tranexamic acid, blood product use, factor replacement dose in scoliosis surgery of patient with Sotos syndrome and factor VIII deficiency.

43AP02-2 ROTEM-guided transfusion in aortic arch dissection re-operation: a clinical case

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Background: Aortic arch dissection re-operations are high-risk procedures often complicated by significant blood loss and coagulopathy. Traditional coagulation tests may fail to offer real-time insight into dynamic coagulation status. ROTEM (Rotation Thrombelastometry) provides a more personalized approach for hemostatic management, improving outcomes and reducing unnecessary transfusions.

Case Report: A 60-year-old male with a history of type A aortic dissection previously underwent ascending aorta replacement. Follow-up imaging showed descending aorta aneurysm and intramural thrombus growth, supplied by the left subclavian artery (LSA). The patient underwent left carotid artery and LSA transposition and was proposed for ascending aorta and aortic arch replacement. Peripheral circulatory arrest (PCA) and hypothermia were required, and substantial blood loss anticipated.

Pre-operative haemoglobin was 16.1 g/dL, with no anticoagulant or antiaggregant use. Hemostatic management was guided by ROTEM. A Tranexamic Acid bolus was given after induction, followed by continuous infusion. Initial ROTEM showed normal clotting times (CT), clot formation time (CFT), and maximum clot firmness (MCF). PCA lasted 33 minutes.

After rewarming, ROTEM showed an A5 in Fibtem of 6mm, with prolonged CT in Fibtem, Extem, and Intem, but normal results in Heptem, indicating heparinization effect and lack of fibrinogen. Fibrinogen was administered. Extracorporeal circulation lasted 169 minutes. ROTEM analysis after fibrinogen replacement showed normalization of coagulation. The patient was extubated the following day and discharged 14 days post-procedure.

Discussion: Aortic arch re-operations carry high morbidity and mortality, mainly due to bleeding and coagulation issues. Conventional tests offer limited information on dynamic clot formation. ROTEM assesses multiple coagulation parameters in real-time, incl

References:

- 1. Karrar, et al., JCVA 2022
- 2. Girdauskas, et al., JTCVS 2010
- 3. Monaco, et al., JCA 2020

Learning Points:

ROTEM provides a real-time, dynamic evaluation of coagulation, helping to guide hemostatic management.

ROTEM optimizes blood product use.

ROTEM-based coagulation management algorithms should be mandatory.uding clotting time, clot strength, and fibrinolysis, providing better guidance for hemostatic management.

This case demonstrates ROTEM's role in optimizing hemostatic control and minimizing bleeding and clotting risks during complex surgeries.

43AP02-3

The illusion of warm infusions - an experimental study

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Background and Goal of Study: Intraoperative hypothermia is a common complication [1]. We aimed to investigate whether prewarmed infusions are superior to cold infusions, with and without the use of a warming device.

Materials and Methods: This experiment was conducted in an operating room with a room temperature of 19°C. Each NaCl 0.9% infusion bag was connected to an infusion tube. Infusion-pumps (Volumat* Agilia, Fresenius Kabi) maintained flow rates at 100 ml/h for 360 minutes. Temperature was measured in all bags and at distal ends of the infusion lines every 15 minutes using thermistor sensors (a-line™ YSI 400, Anandic Medical Systems AG) and monitors (IntelliVue* X2, Philips). The experiment involved four infusion setups. A cold infusion at room temperature, a pre-warmed infusion at 37.0°C and a cold and pre-warmed infusion with additional use of warming device (Bair Hugger™, 3M™ or Hotline®, Smith Medical). The devices were activated at 60 minutes and deactivated at 300 minutes. All experiments were repeated twice and averages of both are reported.

Results and Discussion: Temperature in warm infusion bags approached room temperature after about 180 minutes. Without using a warming device, there was no temperature difference at the distal end of the infusion line, regardless of using a pre-warmed or cold infusion. Wrapping the infusion line in a forced-air warming device was able to increase the infusion temperature by a maximum of four degrees. Only a fluid-warming device was able to increase temperature at the distal end to about 33°C.

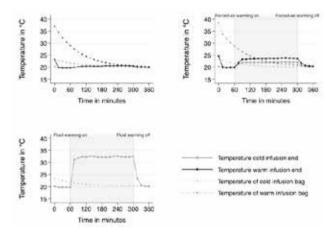


Figure: Scatterplots of temperature measurements over time in the infusion bag and infusion end without and with warming devices for cold and pre-warmed infusions.

Conclusions: Prewarmed infusions offer no thermal advantage at standard flow rates. Only an infusion warming device reliably heats the administered infusion fluids, however, still below the desired body temperature.

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 Mendonca FT, Ferreira JDS, Guilardi VHF, Guimaraes GMN.
 Prevalence of Inadvertent Perioperative Hypothermia and Associated Factors: A Cross-Sectional Study. Ther Hypothermia Temp Manag. 2021;11:208-15.

43AP02-4

Unexpected bloodshed: diagnosing G6PD deficiency amidst intraoperative hematuria

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Background: Glucose-6-phosphate dehydrogenase (G6PD) deficiency is an X-linked genetic disorder that predisposes individuals to hemolytic anemia under oxidative stress. It is crucial to recognize this condition, especially in surgical settings where blood transfusions are common. This case report discusses a patient who experienced significant postop complications due to undiagnosed G6PD deficiency.

Report: A 47year female with history of diabetes and stroke underwent laparoscopic hysterectomy under general anesthesia with propofol, sevoflurane. Intraoperatively she received 2 blood transfusions and developed bloody urine. Urologists confirmed the absense of bladdder or ureteric injury with methylene blue. The patient developed rashes all over the body and reddish urine in the recovery room not associated with hypotension, itching or breathing difficulty. Differential diagnosis included mistmatched transfusion, acute hemolytic reaction, anaphylaxis. She was managed successfully with crystalloid infusion, steroids and diuretics. Post op blood investigations-CBC indicated mild anemia, elevated reticulocyte count, increased Indirect bilirubin and LDH. Peripheral blood smear showed bite cells and Heinz bodies, suggestive of oxidative damage. DirectCoomb'sTest, IndirectCoomb'sTest, and cold agglutinin test were negative suggestive of intravascular hemolysis. Flow cytometry, osmotic fragility, G6PD levels and APLA screening confirmed G6PD deficiency.

Discussion: Intraoperative hematuria in patients with G6PD deficiency can indicate acute hemolytic anemia due to oxidative stress from surgical procedures or medications. Anesthesia poses additional concerns, as certain agents can trigger hemolysis. Careful selection of anesthetic drugs is essential, avoiding those known to induce oxidative stress, while vigilant monitoring for signs of hemolysis is crucial to prevent severe complications perioperatively.Ref:Valiaveedan S, Anaesthetic management in patients with glucose-6-phosphate dehydrogenase deficiency undergoing neurosurgical procedures. Indian J Anaesth. 2011 Jan;55(1):68-70.

Learning points: This case underscores the necessity of considering G6PD deficiency in patients presenting with hematuria and rashes following surgical interventions and blood transfusions. Early recognition and management can significantly improve patient outcomes. Future recommendations include preoperative screening for G6PD deficiency in at-risk populations to mitigate potential complications.

43AP02-5

Anesthetic management in a patient with a giant neurofibroma

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Background: Neurofibromas are benign nerve sheath tumors that may occur as part of neurofibromatosis type 1 (1,3). Managing patients with giant neurofibromas poses challenges such as hemodynamic instability, prolonged surgery, and significant blood loss (2).

Case report: A 41-year-old male (height: 160 cm, weight: 40 kg) with a giant neurofibroma (110 × 50 cm, 60 kg) on his right thigh and presented for surgical excision. He had hypothyroidism, third-degree mitral regurgitation, and severe anemia (hemoglobin: 5.7 g/dL). Preoperative corrections included electrolyte repletion (serum sodium: 128 mmol/L), blood transfusions(recombinant factor VIIa, erythrocyte suspension) and intraoperative embolization of feeding arteries with an aortic balloon. Preoperative sodium and hemoglobin levels improved to 132 mmol/L and 8 g/dL, respectively.

The patient was positioned on two surgical tables. Peripheral venous, arterial, and central venous accesses were established. Anesthesia was induced with propofol, fentanyl, and rocuronium, and maintained during a 12-hour surgery and 13-hour anesthesia duration. Fluid management included crystalloids, colloids, erythrocyte suspension, platelets (apheresis) and fresh frozen plasma. Noradrenaline infusion was used to maintain hemodynamics. A VAC device was applied to close a 35 × 30 cm defect.



Discussion: Managing giant neurofibromas requires meticulous planning (2). Preoperative embolization and intraoperative aortic balloon placement minimized blood loss. Recombinant factor VIIa and VAC devices were critical in addressing coagulopathy and wound healing.

References:

- 1. Rapini RP, Bolognia JL, Jorizzo JL. Dermatology: 2-Volume Set. Mosby: 2007.
- 2. Mikami T. Honma-Koretsune Y. Tsunoda Y. et al. Cardiac overload resolved by resection of a large plexiform neurofibroma: A case report. BMC Surgery. 2020;20(1):106.
- 3. Packer RJ, Gutmann DH, Rubenstein A, et al. Plexiform neurofibromas in NF1: Toward biologic-based therapy. Neurology. 2002;58(10):1461-1470.

Learning points: This case highlights the importance of multidisciplinary collaboration and tailored anesthetic strategies to achieve favorable outcomes in patients with giant neurofibromas.

43AP02-6

Patient Blood Management implementation program in laparoscopic surgery in colorectal cancer: update

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Background and Goal of Study: The inappropriate transfusion of blood components is a frequent risky practice with real consequences for the patient and the healthcare system. Strategies such as Patient Blood Management (PBM) have proven useful in optimizing blood products and improving the clinical outcome of patients undergoing colorectal cancer surgery. PBM programs focus on improving blood volume, minimizing bleeding and optimizing anaemia tolerance by applying strict transfusion criteria. The aim of this study was to track and update the progressive adherence to a PBM protocol in patients undergoing laparoscopic colorectal cancer surgery at our centre over a period of six years. Materials and Methods: We used data collected at our institution between 2017 and 2022 as part of a multi-centre, observational, and non-interventional study created in order to better optimize the use of blood products (MAPBM project1). A descriptive statistical analysis was used.

Results and Discussion:

		2017	2018	2019	2020	2021	2022
	N	45	74	78	73	101	103
1st	Anaemia treated pre-intervention (%)	5.4	23.5	40.5	50	51.1	52.6
Pillar	Intervention with anaemia (%)	8.6	4.2	3.2	6.5	2.2	2.9
	Transfusion rate (%)	13.3	8.1	10.3	11	6.9	10.7
3rd	Haemoglobin trigger to transfusion (g/dL)	9.1	9.2	8.1	8	7.8	7.6
Pillar	Transfusion with haemoglobin > 8 g/dL (%)	60	80	50	60	50	33.3
	Complications (%)	22.2	17.8	14.1	20.3	10.1	12.6
Outco-	Mortality (%)	2.2	1.3	1.3	0	0	0
mes	Length of stay (days)	9.8	9.5	10.6	7.7	7.3	9.1
	Readmission (%)	13.6	4.2	3.9	8.1	3	8.8

Over the period of the study, the number of anaemic patients receiving preoperative treatment has been increasing in parallel with a decrease in the number of patients undergoing procedures with anaemia. The transfusion trigger has decreased from 9,1 g/dL to 7,6 g/dL, with a decrease in the number of transfusions with haemoglobin over 8 g/dL and a trend towards a reduction in the transfusion rate. A tendency for morbimortality to decline was seen.

Conclusion(s): Despite the improvement in some points, more efforts should be made to improve adherence among all professionals to enhance clinical outcomes. In order to treat preoperative anaemia, intravenous iron was used nearly exclusively. However, the recent addition of erythropoietin stimulants to our PBM protocol may improve results.

Reference:

1. Blood transfusion 2021, 19(3): 205-15.

43AP02-7

Rationalizing blood reserves in elective neurosurgery: learning from observed practice

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Background and Goal of Study: In neurosurgical patients, preventing and managing anaemia is essential to improve neurological outcomes. Although reserving blood for elective surgeries is a common practice, it can lead to inefficient resource utilisation and increased workload for blood banks. In our centre, we have an established protocol following the fundamentals of Patient Blood Management in order to optimize preoperative anaemia and determine the necessity of blood reservations.

This study examines the correlation between preoperative blood reservations and actual transfusions in elective craniotomies, aiming to identify opportunities for reducing unnecessary blood reservations and optimise resource use.

Materials and Methods: A retrospective observational study was conducted on 136 patients undergoing elective craniotomies for tumour pathology (109 cases) or vascular surgery (28 cases) between October 2021 and July 2024. We excluded non-craniotomy neurosurgeries, craniotomies for other indications and emergency procedures. Data collected included preoperative haemoglobin (Hb) levels, blood reservation requests, intraoperative and early postoperative (24 hours) transfusions, and postoperative Hb levels. The transfusion index (TI) was calculated as the number of units transfused divided by the number of patients with cross-matched blood.

Results and Discussion: Preoperative blood reservations were made for 87 patients (63.97%), with an average Hb of 13.83 g/ dL. Only five patients (3.7%) required transfusions, all intraoperatively, receiving an average of 1.2 units each. These transfusions occurred exclusively during tumour surgeries, with 80% involving benign tumours; all had preoperative blood reservations.

The TI was 0.069. According to available literature, an ideal TI is situated at values ≥0.5 to ensure good use of resources.

These results highlight an overestimation of haemorrhagic risk in elective neurosurgery, leading to an excess of blood reservations. This excess has notable economic implications and affirms the need to improve transfusion practices.

Conclusion: A low TI suggests excessive blood reservations relative to current usage, indicating inefficiencies in current practices. Implementing stricter criteria for preoperative blood reservations could enhance resource efficiency and eliminate unnecessary practices in transfusion medicine. These findings will aid in reviewing our blood reservation protocol for elective neurosurgeries.

43AP02-10

Heparin-Induced Thrombocytopenia in patients with circulatory support: literature review and case series

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Background and Goal of Study: Circulatory assist devices expose blood to external surfaces, triggering platelet activation and the coagulation cascade, which increases coagulability. To prevent device failure due to thrombosis, anticoagulation – typically with unfractionated heparin (UFH) – is used. UFH's short half-life allows for monitoring and dose adjustment, but it can lead to heparin-induced thrombocytopenia (HIT), a rare immune reaction caused by anti-platelet factor 4 antibodies. These complexes cause ischemic events and hemorrhagic complications. Patients with temporary circulatory devices may face increased risk due to prolonged UFH use. This study evaluates the incidence of HIT, risk factors, and clinical outcomes in a cohort treated from 2000 to 2022

Materials and Methods: A single-center study analyzed 68 patients with temporary circulatory support receiving UFH for ≥5 days. HIT diagnosis was based on the 4T score and confirmed using serological tests (anti-PF4-H antibodies) and functional assays (serotonin release) in selected cases. Clinical variables, including demographics, complications, and mortality, were recorded.

Results and Discussion: HIT incidence was 17.65%, higher than the general population's 0.1-5%. Women had a higher incidence (31.25%) than men (13.46%), reflecting immunological gender differences. Average UFH therapy lasted 18.7 days. Complications occurred in 85% of patients: infections (66.2%), bleeding (63.2%), and thrombosis (29.4%).

Overall mortality was 53%, but lower in HIT patients (33%) versus non-HIT patients (57.1%), likely due to alternative anticoagulants like argatroban and bivalirudin. These managed thrombotic complications without increasing bleeding. HIT correlated with thrombosis but not infections or bleeding, emphasizing timely diagnosis and treatment.

The 4T score was effective for screening, with serological tests confirming HIT. Prolonged UFH use increased HIT risk, highlighting the need for alternative anticoagulants in high-risk patients.

Conclusion(s): HIT is a significant complication in patients with temporary circulatory support, especially women. Early diagnosis and alternative anticoagulants are essential to minimize complications and improve outcomes. This study underscores the importance of tailored protocols to balance thrombotic and hemorrhagic risks in this critical population.

Reference:

Kato C, Oakes M, Kim M, et al.Anticoagulation strategies in extracorporeal circulatory devices in adult populations.

43AP02-11

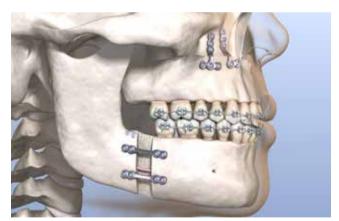
Acute normovolemic hemodilution (ANH) and intraoperative autotransfusion during the orthognathic two-jaw surgery (bimaxillary osteotomy)

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Background: Orthognathic surgery, or two-jaw osteotomy, is a treatment choice for jaw deformities and malocclusion in adults and often differs in complexity and large blood loss. The expected blood loss during orthognathic surgery is 1 to 2 liters, which reasonably increases the risk of hypotension, acute cardiovascular events, acidosis, coagulopathy, and finally, the demand for massive allogenic blood transfusions followed by reactions and infections. Acute normovolemic hemodilution is recognized as an evidence-based method that improves outcomes in liver transplantation and cardiac surgery. The idea to implement ANH in our Center for Orthognathic Surgery was based on a hypothesis that it can also be helpful in the blood-saving strategy.

Case Report: A 20-year-old male, diagnosed with congenital anomaly of both jaws, planned surgery – orthognathic two-jaw surgery. To reduce the risk of blood loss, ANH was used. Hemoglobin, erythrocyte, and hematocrit values are shown in Table. Before the operation, 800.0 whole blood (2 units) was collected from the patient, which was calculated according to the formula and replaced with crystalloid solutions.

Total blood loss during the operation was 1500 ml was recorded. After the main stage of the operation and surgical hemostasis, autohemotransfusion was performed. The volume of blood loss was also replaced with a crystalloid solution. ABP was maintained due to the infusion of norepinephrine with a dose of 0,1 mcg/kg/min.



	Hb	Htc	RBC
Before operation	147	43,8	3,84
Next day	116	34,4	3,78

Discussion: Orthognathic surgery is characterized by acute blood loss, leading to the need for massive allogenic blood transfusion and increased associated risks. ANH allows for reduced whole blood loss during surgery and eliminates the need for blood transfusion. The patient spent 4 days in the surgical department; total blood loss was 1500,0. No transfusion was required, so the patient was discharged without complications.

Learning points: ANH may be considered a blood-saving strategy for patients requiring orthognathic surgery.

43AP02-12

Pulmonary embolism under general anesthesia: A rare complication requiring vigilant monitoring

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Background: Acute pulmonary embolism (PE) is a rare but potentially fatal perioperative complication, with a mortality rate of approximately 25% in massive PE and even higher with cardiac arrest. Severity is linked to the degree of pulmonary artery obstruction, potentially leading to rapid hemodynamic instability.1 Intraoperative detection is especially difficult under general anesthesia, as classic symptoms like dyspnea and pleuritic chest pain are absent.² Early recognition and treatment are crucial for improving outcomes.

Case Report: A 35-year-old female with prior history of protein S deficiency and previous unilateral PE and deep vein thrombosis, for which she was under anticoagulant therapy, underwent left adrenalectomy, ipsilateral radical nephrectomy and inferior vena cava (IVC) thrombectomy, under general anesthesia. During tumor resection, a sudden decrease in end-tidal CO₂ (ETCO₂) combined with oscillation of the plateau phase of capnography and an increase in PaCO_a raised suspicion about PE. No other change in hemodynamics or ventilation was noted. Surgery was completed under stable hemodynamics. The patient underwent emergent chest computer tomography angiography, which showed filling defects in an inferior branch of the left pulmonary artery. The patient was then transferred to the ICU and weaned from the ventilator on the same day. Since there was no evidence of respiratory insufficiency or hemodynamic instability, the initiation of anticoagulation therapy with low-molecular-weight (LMWH) heparin was deferred for 24 hours to mitigate the risk of bleeding.

Discussion: Intraoperative PE, though rare, demands rapid recognition and management to improve survival. Under anesthesia, classic symptoms are absent, making indirect signs key diagnostic tools. Management involves anticoagulation therapy, to mitigate the risk of clot propagation and recurrent thromboembolic events. However, postoperative patients often present a dual challenge of balancing thromboembolic risk with bleeding risk. requiring an engaging multidisciplinary team to optimize timing of anticoagulation therapy.

References:

1. Ann Thorac Cardiovasc Surg 2020;26:65-71;110:1072-1080. 2. J Cardiothorac Vasc Anesth 2020;34:1972-1984

Learning Points: Sudden ETCO2 decrease and an elevation in PaCO2 on blood gas analysis are diagnostic clues to detect potential PE. Successful treatment involves collaborative management.

43AP03-1

Tissue perfusion response to fluid challenges using a novel urothelium perfusion monitor targeted perfusion based fluid management in critically ill patients using urethral perfusion (the **TARGET-UP study)**

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Background and Goal of Study: Traditionally, resuscitation efforts have focused on macrocirculatory targets, such as blood pressure and cardiac output. However, achieving these targets does not always correlate with improved microcirculatory perfusion. The urethral perfusion index (UPi) is a marker of tissue perfusion, offering a novel approach to monitoring. Utilizing photoplethysmographic technology, the UPi is measured through a specialized device integrated into a Foley catheter.

The aim of this study is to explore the relationship between the macrocirculatory response and tissue blood flow to a fluid challenge (FC).

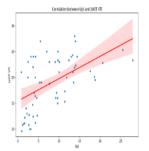
Materials and Methods: This single-center, prospective study was conducted at a tertiary-level hospital. All patients were adult, mechanically ventilated, in which the treatting team had equipoise about fluid responsiveness. LVOT VTi and UPi were measured before and after FC. Patients were considered responders if either LVOT VTi or UPi increased by 10% after FC.

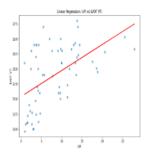
Results and Discussion: Patient demographics are shown in table 1. There was no difference in baseline characteristics between responders and non-responders. The most common phenotype were VTi AND UPi unresponder, followed by VTi unresponder BUT UPi responder (Table 1).

	Total	Unresponsive (n=12)	Responsive (n=15)	P-value
Male	16	5	10	0.094
Ago	57.1 (12.4)	54 (12.7)	55.5 (11)	.352
Baseline MAP	74 (10)	74 (11)	77 (12)	.463
Baseline HR	89 (25)	87 (29)	88 (23)	.303
Baseline UPi	8.2 (7.0)	10.0 (8.3)	7.3 (12.7)	.730
Baseline LVOT VTi	17.9 (4.9)	17.3 (5.1)	18.56 (4.5)	.584

	UPi responder	UPi unresponder
VTi responder	5	6
VTi unresponder	11	14

The relationship between LVOT VTi and UPi are shown in fig 1 with a coefficient index of 0.552 (p<0.001) and a R2 value of 0.272.





There was a trend towards lower UPi in patients who were dead at 28- and 90-days.

Conclusion(s): There is weak correlation between LVOT VTi and UPi but a heterogeneous response was seen in UPi and LVOT VTi response to fluid. This may be reflective of incoherence between circulatory beds or an issue with the way the UPi signal is calculated. Further research is required to further investigate this monitoring modality.

Acknowledgements: The study was funded by a grant from ES-AIC

43AP03-2

Distinctive features of rotational thromboelastometry in infective endocarditis: a retrospective propensity score-matched observational study

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Background: The hemostatic system is involved in the formation of valvular vegetations and in the systemic activation of coagulation, which can lead to both thrombosis and consumption coagulopathy. Consequently, patients with infective endocarditis undergoing valvular surgery present a set of specific challenges to cardiac anaesthesiologists. Rotational thromboelastometry (ROTEM) is a point-of-care viscoelastic clotting test that may assist in understanding the patient's coagulation status and in the tailoring of therapy.

In the present retrospective propensity score-matched study, we examine the distinctive features of ROTEM in patients with endocarditis in comparison to the general population undergoing cardiac surgery.

Materials and Methods: A retrospective analysis was conducted on the database of patients who underwent valvular procedures between 31st May 2022 and 31st August 2024. We aimed to identify patients in whom ROTEM was conducted once during the extracorporeal circulation and once after heparin reversal. The study group comprised patients with endocarditis, while the control group was created by propensity-score matching of patients without endocarditis.

The primary outcome of this study is the result of the on-pump ROTEM examination.

Secondary outcomes include the differences between the utilisation of prothrombin complex concentrate (PCC), fibrinogen concentrate (FC), fresh frozen plasma (FFP) and platelets.

Results and Discussion: 23 patients were analysed in each group. Our findings indicate that patients with endocarditis exhibit prolonged clotting times in EXTEM (156 vs 117 s, p=0.001) and augmented clot firmness in FIBTEM (19 vs 15 mm, p=0.012) and in EXTEM (48 vs 43 mm, p=0.045) when compared to similar patients without endocarditis. To restore optimal coagulation in this cohort, more PCC (3391 vs 2652 units, p=0.014) and FFP (7 vs 5 units, p=0.038) need to be administered. The number of transfused units of platelets (p=0.089) and amount of FC (p=0.109) did not differ significantly.

Conclusions: Patients with infective endocarditis exhibit distinctive viscoelastic profiles, characterised by prolonged clotting time and elevated maximum clot firmness. They require more FFP transfusions and PCC supplementation.

Further research is necessary to establish the optimal target values in ROTEM tests, with the aim of minimising bleeding risk while avoiding an increase in thrombotic risk.

43AP03-3

Dose-response relationship of clotting time in the EXTEM rotational thromboelastometry assay after administration of prothrombin complex concentrate - a retrospective observational study

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Background: Coagulopathy after cardiac surgery results in increased morbidity and mortality. Four-factor prothrombin complex concentrate (PCC) allows rapid replacement of coagulation factors with a safety profile comparable to that of standard care. Although rotational thromboelastometry (ROTEM) is often used to guide PCC dosing, the dose-response relationship of clotting time (CT) in ROTEM and the dose of PCC has not been investigated.

This may lead to under- or over-dosing of PCC and failure to achieve the desired CT target in the EXTEM assay. In this study, we aimed to investigate this relationship in patients undergoing cardiac surgery.

Materials and Methods: We retrospectively analysed the patients who underwent cardiac surgery between May 2022 and August 2024. We included patients who underwent ROTEM during cardiopulmonary bypass (CPB), who received PCC after heparin reversal, and who subsequently underwent repeat ROTEM. Patients who received fresh frozen plasma between the two tests were excluded from the analysis. Logistic regression analyses were used to determine the relationship between change in clotting time, dose of PCC and initial CT.

Furthermore, we compared doses per total, ideal (IBW), and lean body weight to investigate which allows for the best predictions of the change in clotting time (Δ CT).

Results and Discussion: Data from 178 patients were analysed. The initial CT in EXTEM (EXT1-CT) was 104 (IQR 92-135) s, the median PCC dose was 3000 (IQR 2500-4000) units and the CT in the second EXTEM was 77 (IQR 70-88) s. The EXT1-CT

(p<0.001) but not the PCC dose per kg (p=0.648) was a significant predictor of Δ CT. The overall regression model was significant: R2=0.595, f(0.177)=128, p<0.001. The equation of the line of best fit was: $\Delta CT = 52 + 0.244 \cdot EXT1-CT [s]$.

Our data questions the existence of a strong dose-response relationship between the weight-based dose of PCC and Δ CT. The magnitude of the response primarily depends on the initial CT, with greater change per unit per kilogram in patients with severely prolonged EXT1-CT and weak responses with an EXT1-CT close to normal. Only a weak correlation exists between PCC dose per kg IBW and Δ CT (Pearson's r=0.365, p<0.001).

Conclusions: The initial clotting time in EXTEM is the strongest predictor of Δ CT. PCC dose per kg body weight does not significantly predict the response. Further research is needed to determine the efficacy and safety of different CT targets in cardiac patients.

8.77 (0.60 , 0.54

43AP03-4

Comparing liberal and restrictive blood transfusion strategies in moderate to severe acute brain injury: a systematic review and metaanalysis

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Background and Goal of Study: Maintaining adequate hemoglobin levels is crucial for delivering oxygen to the brain and may influence the neurological prognosis of patients with acute brain injuries. However, the precise hemoglobin threshold for initiating blood transfusions in these patients has not been definitively established.

Materials and Methods: We conducted a systematic review and meta-analysis to evaluate the clinical impact of liberal (transfusion threshold by hemoglobin <9 g/dL or <10 g/dL) versus restrictive (transfusion threshold by hemoglobin <7 g/dL) red blood cell transfusion strategies in adult patients with moderate to severe acute brain injury. Our search included PubMed, the Cochrane Central Register of Controlled Trials (CENTRAL), and Embase to identify relevant randomized controlled trials from inception to October 15, 2024.

The primary outcome was the occurrence of unfavorable neurological outcomes at six months. Secondary outcome was allcause mortality.

Results and Discussion: A total of four studies met the inclusion criteria for the meta-analysis. The liberal blood transfusion strategy was associated with a lower likelihood of unfavorable neurologic outcomes at 6 months than liberal blood transfusion strategy (odds ratio: 0.77, 95% CI: 0.63 to 0.94, p=0.009). However, there was no statistically significant difference in the six-month mortality rate between the two groups (odds ratio: 0.94, 95% CI: 0.76 to 1.18, p=0.61).

Conclusion(s): A liberal blood transfusion strategy may improve neurological outcomes in patients with acute brain injury. However, the moderate heterogeneity observed in previous studies indicates that further research is needed to clarify the optimal transfusion strategies for this population.

43AP03-5

Periarticular vasoconstrictor infiltration (PVI) technique for lumbar arthrodesis

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Background and Goal of Study: Significant blood loss is a welldocumented complication in major orthopedic procedures, like lumbar arthrodesis. Tranexamic, although effective as a prophylactic agent, has contraindications that limit its use. Building upon WALANT technique, periarticular vasoconstrictor infiltration (PVI) offers an alternative. This pilot study aims to evaluate PVI as a potential strategy for reducing perioperative bleeding in these procedures.

Materials and Methods: Ten patients undergoing lumbar arthrodesis received this treatment. Three patients were excluded from receiving tranexamic acid due to contraindications. Under general anesthesia, patients were positioned prone and underwent ultrasound-guided periarticular adrenaline infiltration. The adrenaline solution was diluted to a concentration of 1:400,000 for non-cardiopathic patients and 1:1,000,000 for those with cardiac conditions. A total of 30 ml was injected at each level, infiltrating the thoracolumbar fascia, the retrolaminar space, and the supraspinous ligament. Intraoperative bleeding was assessed by recording the volume of aspirated blood and the subjective evaluation of the trauma surgeons.



Results and Discussion: The procedure was carried without complications in all cases, without any hemodynamic disturbances attributable to the infiltration of adrenaline. Trauma surgeons' subjective assessments were positive, observing reduced intraoperative bleeding compared to patients who received either tranexamic acid or no prophylactic treatment.

Conclusion(s): The data obtained, although limited, suggest that PVI could be a valuable tool to decrease intraoperative bleeding in arthrodesis procedures, without producing adverse effects. However, larger studies are warranted to confirm these findings.

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43AP03-6

Perioperative ROTEM-guided management of haemorrhage and anticoagulation in pancreatic cancer with portal vein thrombosis: a case report

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Background: Portal vein thrombosis, particularly when accompanied by portal hypertension due to thrombotic occlusion of the portal vein(PVT), presents therapeutic challenges for the anaesthesiologist. Oncologic patients are at heightened risk for both thromboembolic events and bleeding, complicating perioperative anticoagulation management. ROTEM offers dynamic assessment of coagulation, guiding bleeding treatment as well as personalized anticoagulation(1)(2).

Case report: A 37-year-old woman with pancreatic adenocarcinoma and portal hypertension secondary to PVT underwent mechanical thrombectomy and transjugular intrahepatic portosystemic shunt(TIPS) placement.

Post-procedural complications included severe hemoperitoneum due to splenic artery injury, leading to hypovolemic shock. The patient developed coagulopathy due to transient hepatic injury. ROTEM was employed to guide haemorrhagic shock's treatment and anticoagulation reintroduction, balancing bleeding and thrombosis risk. The patient's condition was successfully stabilized, illustrating ROTEM's value in this case.

Discussion: Although ROTEM is not validated for guiding anticoagulation therapy, this case underscores its potential utility in similar clinical scenarios (1)(2)(3). ROTEM provides a comprehensive, real-time assessment of coagulation, offering advantages over traditional tests. Cancer patients often face both thrombotic and haemorrhagic complications, and ROTEM's ability to tailor anticoagulation therapy helps optimize treatment and improve outcomes (1)(3).

The use of interventional radiology and ROTEM-guided treatment demonstrates the importance of a personalized, multidisciplinary approach in managing complex coagulopathy and vascular conditions (1)(2).

References:

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- 2. Shen L, et al. Viscoelastic Testing Inside and Beyond the Operating Room. J Thorac Dis. 2017;9(S4):S299-S308 3. Walsh M, et al. Viscoelastic Testing in Oncology Patients, Including for the Diagnosis of Fibrinolysis. Transfusion. 2020:60:S86-S100

Learning points:

- TIPS effectively decompresses portal hypertension but requires close monitoring for bleeding, ischemic complications and coagu-
- ROTEM-guided anticoagulation ensures precise control over haemostasis improving patient outcomes.
- Perioperative ROTEM management of every anaesthesiologist should be mandatory.

43AP03-7

Acute pulmonary edema in hysteroscopy intravascular absorption syndrome

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Background: Intravascular absorption syndrome in hysteroscopy is a rare condition caused by intravascular absorption of uterine distending fluid¹. This fluid overload may lead to life-threatening complications, in which acute pulmonary edema is an example^{1,2}. We present the case of a woman who developed pulmonary edema during hysteroscopic surgery.

Case Report: A 61-year-old woman with a history of uterine polyps was proposed to ambulatory hysteroscopic surgery. She had hypertension, depressive disorder and Crohn's disease and was medically controlled. Pre-operative assessment, including routine investigations were normal. The procedure was performed under total intravenous anesthesia with propofol. Normal saline (0.9%) fluid was used during the hysteroscopy. During the procedure, an increase in blood pressure to 213/142 mmHg was observed and oxygen saturation decreased to 85%.

After checking possible causes, a deficit of approximately 2000 mL of irrigation fluids was found and bilateral inspiratory crackles with decreased breath sounds were noted during auscultation. Acute pulmonary edema was suspected. Surgery was stopped and a set of measures were taken: oxygen was increased to 100%, secretions were suctioned and isosorbide dinitrate plus furosemide were administered. Workup showed pulmonary edema on chest radiograph and mild metabolic acidosis (without hvponatremia) in blood gas analysis.

The patient responded well to these measures and was hospitalised for 2 days for further ventilatory and hemodynamic improve-

Discussion: This case reports an acute pulmonary edema in hysteroscopic surgery caused by excessive absorption of fluid. We aim to increase awareness to this condition and highlight the importance of rigorous monitoring of the fluid balance. Normal saline fluids decreases the development of hyponatremia and neurological symptoms.

References:

- 1. Sethi N. et al. Operative hysteroscopy intravascular absorption syndrome: A bolt from the blue. Indian J Anaesth. 2012 Mar:56(2):179-82.
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Learning Points: Close monitoring of the fluid balance together with early recognition of clinical changes during hysteroscopy surgery are essential to prevent complications.

43AP03-8

Transfusion and mortality within 24 hours after major trauma in patients with direct-acting oral anticoagulants

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Background and Goal of Study: Major trauma in patients treated with direct oral anticoagulants (DOACs) is an increasing event. DOACs have gradually replaced warfarin due to favorable efficacy and safety profiles. However, treatment with anticoagulants may be a complicating factor in trauma due to the increased risk of bleeding. Drug-specific reversing agents are available for DOACs, but evidence is lacking regarding their benefits on mortality and morbidity in trauma.

Only one such agent (idarucizumab for dabigatran) is used in Sweden, while administration of andexanet alfa (for reversal of apixaban, edoxaban and rivaroxaban) is not endorsed by national recommendations since proof of benefit has not been presented compared to administration of prothrombin complex concentrate.

The aims were to analyze if patients treated with DOACs presenting with major trauma were more likely to receive blood transfusions, and if they had a higher mortality rate within the first 24 hours after hospital admission, compared to patients with no anticoagulant medication.

Materials and Methods: This was a single-center, retrospective study. Inclusion criteria were age ≥ 18 years and a New Injury Severity Score of > 15. The Swedish trauma register (Swetrau) and medical records were used to identify patients and to retrieve data on treatment with DOAC.

Cases were matched to controls for sex, age, injury mechanism, and for pre-injury physical status according to the classification system of the American Society for Anesthesiology (ASA).

Controls were selected using an exact matching procedure with replacement. Conditional logistic regression was used to analyze dichotomous outcomes.

Results and Discussion: A total of 653 patients admitted to the Sahlgrenska University Hospital in Gothenburg, Sweden between the years 2020-2023 were surveyed. Of these, 47 patients had DOAC.

Mortality within 24 hours was observed in 6/47 (13%) patients in the DOAC group compared to 17/222 (8%) in the matched non-DOAC group, OR 1.69 (95% CI 0.62 to 4.58). Erythrocytes transfusion was required in 18 (38%) patients among the cases compared to 49/222 (22%) in the matched control group, OR 2.11 (95% CI 1.07 to 4.17).

Conclusion(s): Patients with major trauma during treatment with DOACs were more likely to receive erythrocyte transfusions during the first 24 hours after hospital admission compared to patients without anticoagulant treatment, while 24-hour mortality was not higher among patients with DOACs.

43AP03-10

Evaluation of anticoagulation in patients undergoing ECMO-assisted bilateral lung transplantation and its impact on perioperative bleeding and thrombotic complications: a single-center, retrospective study

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Background and Goal of Study: Lung transplantation often requires intraoperative support with extracorporeal membrane oxygenation (ECMO), which exposes patients to risks of bleeding and thrombotic complications.

However, no consensus currently exists regarding the optimal anticoagulation strategy during ECMO. This retrospective study describes anticoagulation strategies during ECMO initiation in bilateral lung transplantation and evaluates their impact on associated perioperative bleeding and thrombotic events.

Materials and Methods: We focused on bilateral lung transplantations performed at Erasme Hospital between 2014 and 2023. Patients were classified into two groups according to whether ECMO was used or not, and whether anticoagulation was administered or not.

Primary and secondary outcomes of interest included the incidence of bleeding and thrombosis (of the ECMO circuit and occurring in patients) respectively, during intraoperative period and postoperative period.

The Chi-square test was used for the categorical variables and the independent t-test was used for the continuous variables. A p-value < 0.05 was considered statistically significant. Analyses were performed with IBM SPSS Statistics.

Results and Discussion: Among 134 lung transplant patients over a 10-year period, 18% required perioperative ECMO. Of those who received ECMO, 40% were anticoagulated with unfractionated heparin (UFH).

The rate of intraoperative thrombosis was not associated with the presence of ECMO (p > 0.05) and was not prevented by the administration of UFH (p > 0.05).

The rates of transfusions of red blood cell (RBC) and fresh frozen plasma (FFP) during the intraoperative period were higher when ECMO was implemented (p < 0.05) and were not influenced by the administration of UFH (p > 0.05).

Postoperative thrombotic and hemorrhagic complications were influenced by the presence of ECMO (p < 0.05) but were not influenced by perioperative anticoagulation (p > 0.05).

Conclusion(s): In this observational study, ECMO was associated with more hemorrhagic and thrombotic complications. Contact between blood and the foreign surfaces of the ECMO activates the coagulation cascade, leading to important hemostatic changes. The administration of UFH during the procedure did not prevent perioperative thrombotic complications from happening, nor did it increase perioperative transfusion requirements or the number of postoperative hemorrhages. This study could encourage a meta-analysis to confirm first the safety of withholding anticoagulation in ECMO patients.

43AP03-11 IRON-FIT: Investigating Recovery Outcomes in Neck of Femur fracture surgery following IV Iron Therapy (IVIT)

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Background: Post-operative anaemia affects 87% of patients after hip fracture, increasing transfusion rates, perioperative morbidity and mortality1. Effective patient blood management (PBM) to minimise blood transfusion and improve outcome are required. One strategy is the use of intravenous iron, although its effectiveness in emergency surgery, especially in hip fracture patients remains unclear¹. We wished to evaluate the impact of implementing an IVIT protocol on patient outcomes after hip fracture surgery. Methods: Primary outcomes were haemoglobin (Hb) change and transfusion rates and secondary outcomes; the impact on recovery - length of stay (LOS), change in mobility and residential status. Data was retrospectively collected from the National Hip Fracture and PBM audit databases. Patients receiving inpatient IVIT formed the case group, with a control group matched for demographics (age, gender, ASA, admission residential status and AMT). Outcomes were compared and statistically analysed between the two groups using independent samples t-test.

Results: The groups (64 patients in each) had statistically similar demographics. The IVIT group had lower starting Hb (111 vs 123, p=0.001) compared to controls (Fig 1).

However, by discharge there was no significant Hb difference between the two groups (101 vs 103), with a smaller Hb drop in the IVIT group. The IVIT group received more transfusion (0.85 units/person vs 0.5). After excluding transfusion recipients (35 in case

group, 18 in control), the IVIT group still had a smaller Hb drop. There were no significant difference in LOS or post-operatively mobility, but 12% more IVIT patients returned to their own home on discharge.

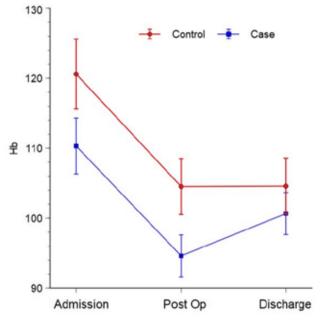


Figure 1: Change in Hb

Conclusion: Results suggest IVIT may benefit recovery and anaemia after hip fracture. Hb drop was lower, including in those not transfused, and despite more initial anaemia the IVIT group showed similar recovery, and more patients returned home. Larger RCTs are needed in this patient cohort.

Reference:

Sinclair R et al. Perioperative intravenous iron to treat patients with fractured hip surgery: a systematic review and meta-analysis. *Health Sci. Rep.* 2022; 5:e633

43AP04-1 Metabolic effects of intravenous iron therapy following blood loss

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Background and Goal of Study: Anemia following major surgery is a complex, multifactorial condition that often presents as iron-deficiency anemia and inflammation-induced anemia, caused by the surgical insult. Variable results from studies on intravenous iron administration after surgery highlight the need for a deeper understanding of the underlying processes.

Perioperative anemia arises from pre-existing chronic anemia, intraoperative blood loss and postoperative inflammation. Intravenous iron administration is a key strategy in minimizing the need for perioperative blood transfusions.

The objective of this study is to assess, on an experimental model, the impact of iron administration after blood loss. **Materials and Methods:** This experimental study involved 35 Wister rats divided into four groups: iron deficiency anemia (n=10), inflammatory anemia induced by administration of intraperitoneal lipopolysaccharide (n=10), combined iron deficiency and inflammatory anemia (n=10) and control group (n=5).

Each group (except control) was split into untreated (n=5) and treated (n=5) subgroups, with the treated subgroup receiving 10mg/kg of ferric carboxymaltose.

Liver tissue was used to determine markers of inflammation and oxidative stress such as malondialdehyde, catalase, IL-6, hepcidin and ferritin.

Results and Discussion: This experimental model was designed to mimic blood loss as well as inflammation following surgery such as cardio-vascular or major abdominal surgery. The combined anemia group showed the highest oxidative stress, though all groups experienced elevated stress. Ferritin levels increased with iron treatment, while IL-6 and hepcidin were highest in iron-deficient and combined anemia groups, suggesting blood loss itself induces inflammation.

Previous studies on postoperative iron therapy have generated conflicting results. This model highlights that hemorrhage can trigger inflammation and secondary anemia, despite general belief that blood loss primarily leads to iron-deficiency anemia.

Our results indicate that further research with better patient stratification is needed to understand the physiopathology of anemia in different surgical contexts. Until then, preoperative assessment and treatment of iron deficiency is the recommended practice.

Conclusion(s): This study explores the intricate responses related to blood loss and inflammation as well as to iron therapy in the context of iron-deficiency, inflammation-induced and combined anemia.

43AP04-2

The causal effect of plasma solution administration on intraoperative hypotension: an illustration of causal inference methods for analyzing time-dependent perioperative treatments

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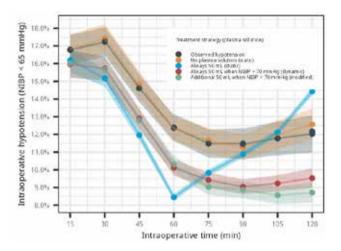
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Background and Study Goals: Intraoperative fluid administration remains a crucial component of anaesthetic care. Despite decades of clinical practice and evidence from clinical trials, optimal fluid treatment strategies are still unknown and warrant further investigation. Using modern causal inference methods, we examine the causal effect of plasma solution administration on intraoperative hypotension for the first time in observational data.

Material and Methods: We used perioperative data (N=10'000) of the publicly available INSPIRE dataset (South Korea, period 2011-2020, doi.org/10.1038/s41597-024-03517-4). Primary outcome was intraoperative hypotension (non-invasive blood pressure (NIBP) < 65 mmHg).

We examined the following treatment strategies (15-min intervals): no plasma solution administration, always 50 mL plasma solution, 50 mL plasma solution only when NIBP dropped < 70 mmHg and an additional (compared to the observed administra-

tion) 50 mL plasma solution when NIBP dropped < 70 mmHg. These strategies model the outcome and treatment assignment and adjust for time-dependent confounders and treatment-confounder feedback.



Results and Discussion: Figure 1 highlights the causal effect of plasma solution administration in reducing hypotension. The beneficial effect increases over time: For example, administrating always 50 mL of plasma solution when NIBP drops < 70 mmHg reduced intraoperative hypotension after 1 hour by -1.5% (95-Cl: -1.8% to -1.2%) and after 2 hours by -2.6% (95-Cl: -3.6% to -1.6%). In a counterfactual setting where clinicians had administered additional 50 mL plasma solution when NIBP dropped < 70 mmHg, our analysis suggests that hypotension after 2 hours could have been reduced by -3.5% (95-Cl: -4.2% to -2.7%).

Conclusions: Recent advances in causal inference methods allow to investigate perioperative treatment strategies relevant in daily clinical practice, for example a NIBP threshold of when to initiate fluid administration. Assuming no unmeasured confounding, we demonstrated the causal effect of so-called static, dynamic and modified treatment strategies on intraoperative hypotension in a large cohort undergoing general anaesthesia.

What is the compliance and use of blood products in terms of the maximum surgical blood ordering schedule (MSBOS)?

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Background and Goal of Study: Blood products are a scarce, expensive but life-saving resource. It is vital that an adequate number of blood products are available for major surgeries. A maximum surgical blood ordering schedule (MSBOS) aims to avoid wasteful crossmatching of blood products while ensuring a safe amount of blood products remain available. The Misericordiae University Hospital have developed a MSBOS specific to their patient cohort.

Aims of study included:

- · To determine the adherence rate to MSBOS
- To determine the consumption rate of the blood cross matched
- · To determine if MSBOS requires updating

Materials and Methods: Retrospective analysis was carried out from four major surgical specialties across a four-week period. The specialties chosen were cardiothoracic surgery, general surgery, spinal surgery and vascular surgery. All cases that occurred were screened. The data collected included the surgical procedure, the number of red cells cross matched, and the number of red cells used. Basic demographic data and the preoperative haemoglobin were also collected. The number of units cross matched were then compared to the current MSBOS to determine compliance. Compliance was defined as cross matching red cells equal to or less than the maximum allowed for each surgery by the MSBOS.

Results and Discussion: 100% of patients (n=237) were screened. 52% (n=124) had red cells cross matched so were assessed. The compliance rate was 66%. The consumption rate of the red cells ordered was 14%. Of the 124 patients assessed; 41% of these were cardiothoracic patients, 26% were spinal patients, 18% were general patients, 15% were vascular patients.

Speciality	Adherence	Consumption
Cardiothoracic	(n=38) 74%	13% (n= 23)
General	(n= 17) 77%	18% (n= 16)
Spinal	(n= 25) 78%	12% (n= 15)
Vascular	(n=2) 11%	19% (n= 10)

Table.

Conclusion(s): The spinal surgery department has the highest rate of compliance with the MSBOS at 79% (n=25). Both the cardiothoracic (n=38) 74%, and general surgery (n=17) 77% departments compliance rates were also above 70%. The vascular department's compliance rate with the MSBOS was the lowest at 11% (n=2). Indicating that the MSBOS needs updating for the vascular department but is appropriate for the other departments assessed.

Rapid monitoring of new oral anticoagulants: qualitative vs. quantitative methods - are they reliable enough?

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Background: Monitoring the efficacy of Non-Vitamin K Antagonist Oral Anticoagulants (NOAC) remains a significant challenge. particularly when rapid decision is essential. In the era of NOAC it has become necessary to develop diagnostic tool that provides rapid results of significant NOAC blood concentration (20-50 ng/ mL) in the preoperative period.

Materials and Methods: We evaluated effect of NOAC therapy during preoperative period in 14 patients. As quantitative method, laboratory assays for precise levels of drug concentration were used and as qualitative one, two point of care tests (DOASENSE Dipstick and ClotPro) for rapid assess of effects. The DOASENSE Dipstick test detects NOAC concentrations exceeding 20 ng/ mL in blood via urine analysis, whereas ClotPro test determines NOAC concentrations exceeding 50 ng/mL. A statistical analysis was conducted using pairwise Cohen's kappa, all variables were binary. The results were visualized using an agreement Heatmap and an ROC curve.

Results and Discussion: Two qualitative tests DOASENSE Dipstick and ClotPro can be utilized as quick indicators in the assessment of coagulation status, providing results in less than one hour. Our intention was to assess sensitivity of those two tests in intention to implement them in daily clinical practice. The Cohen's kappa value of 0,81 for the DOASENSE indicates a strong level of agreement, suggesting that DOASENSE is good predictor of NOAC blood concentration. On other side, the kappa value of 0,55 for ClotPro indicates a moderate level of agreement, which suggests that while ClotPro may still provide useful information it might not be so reliable as the DOASENSE. Using two logistic regression models, an ROC curve was generated with DOASENSE as the outcome variable and ClotPro and blood concentration as the predictors. The AUROC for blood concentration was determined to be 0.88, while ClotPro yielded an AUROC of 0.71. The results indicate that DOASENSE exhibits a strong correlation with NOAC blood concentration, whereas ClotPro shows a weak or negligible correlation.

Conclusion(s): The assessment of bleeding risk is a crucial aspect of an anesthesiologist's daily practice. In the era of new anticoagulants, although clinical experience remains essential, rapid bedside qualitative tests provide invaluable support. The DOA-SENSE Dipstick is a highly reliable tool for the swift detection of novel anticoagulants, enhancing patient safety and facilitating timely decision-making.

Superiority of four-factor prothrombin complex concentrate vs. frozen plasma for bleeding management in adult cardiac surgery patients with coagulopathy: results from a phase 3, randomised, active-control study

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Background and Goal of Study: Cardiac surgery involving cardiopulmonary bypass (CPB) is often complicated by coagulopathic bleeding, leading to morbidity and mortality. Guidelines recommend treatment with frozen plasma (FP) or four-factor prothrombin complex concentrate (PCC) in this setting, but large randomised comparisons were lacking. This trial compared the efficacy and safety of PCC (Octaplex/BALFAXAR, Octapharma) with FP in cardiac surgery.

Materials and Methods: LEX-211 (FARES-II; NCT05523297) was conducted at 12 sites in Canada and the U.S. Patients (pts) aged ≥18 years undergoing cardiac surgery with CPB with coagulopathic bleeding, international normalised ratio (INR) ≥1.5, and requiring coagulation factor replacement, were randomised 1:1 to receive PCC (1500 IU if ≤60 kg; 2000 IU if >60 kg) or FP (3 U if ≤60 kg; 4 U if >60 kg). The clinical team was blinded to group allocation until treatment initiation.

The primary endpoint was haemostatic response (effective if no additional haemostatic interventions were administered from 60 min to 24 h after treatment initiation). Key secondary endpoints included the amount of chest tube drainage, change in INR, incidence of severe to massive bleeding using a modification of the universal definition of perioperative bleeding, and safety. The study was funded by the Canadian Institutes of Health Research and Octapharma.

Results and Discussion: LEX-211 included 420 randomized, treated and consented pts (PCC=213; FP=207). Baseline characteristics were comparable between groups; the median (range) age was 66 (20-88) years and 74% of pts were male. Effective haemostasis was achieved in 77.9% of PCC pts vs. 60.4% of FP pts (estimated difference, 17.6%; 95% CI 8.7, 26.4; p<0.0001 for superiority). The mean±SD change in INR from 30 min before to 1 h after treatment initiation was greater for PCC pts vs. FP pts (-0.9±0.8 vs. -0.7±0.9; p=0.0081). Mean±SD cumulative blood loss at 24 h after the start of surgery was lower in PCC pts vs. FP pts (690.9±465.6 mL vs. 922.9±631.9 mL; p<0.0001). Severe to massive bleeding within 24 h after the start of surgery was lower in PCC pts vs. FP pts (17.4% vs. 37.7%; p<0.0001). Thirtyday treatment-emergent thromboembolic events and mortality occurred in 8.5% and 3.3% of PCC pts and 7.2% and 3.9% of FP pts, respectively.

Conclusion(s): Results from the phase 3, randomised, activecontrol LEX-211 study support the use of PCC over FP for bleeding management in cardiac surgery.

43AP04-6

Maximum Surgical Blood Ordering Schedule (MSBOS) in a tertiary public hospital of Greece

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Background and Goal of Study: MSBOS targets at the optimization of blood ordering management. It depends on the type of operation, patient history (age, comorbidities, bleeding profile, medication) and preoperative Hb level. Ordering of blood products is recorded by transfusion indices: C/T (Crossmatched units/ Transfused units), T% (Tranfusion probability= Patients transfused/Patients cross-matched x100%), TI (Tranfusion Index= Units Tranfused/ Patients cross-matched). Appropriate transfusion management is defined as C/T ≤ 2.5, T% >30%, TI≥ 0.5. Aim of this study was to record blood ordering practice in a tertiary Greek public hospital.

Materials and Methods: Audit of blood bank records from January and Seprember 2023 reported 802 surgical cases. Elective (60.8%) and emergency (39.2%) procedures involved general surgery (38.1%), orthopaedics (22.2%), gynaecology (13.2%), urology (9.6%), neurosurgery (9.2%), ENT, thoracic and vascular surgery. Three different values were recorded: Blood units requested by the surgeons, units cross-matched by the blood bank and units transfused intraoperatively. Statistical analysis was performed using SPSS.

Results and Discussion: A total of 629 blood units were requested, 492 were cross-matched and 92 units were administered intraoperatively. Utilizing transfusion indices, the overall ratios' results were: 'C/T REQUESTED' = 6.84 (units surgeons requested to be cross-matched), 'C/T' = 5.35 (units actually cross-matched by blood bank). T% = 15.3% (64 patients transfused /419 patients cross- matched), TI = 0.22 (92 units transfused/ 419 patients cross-matched). In other words, the units requested were 6.84 times higher and the units prepared 5.35 times higher than those actually transfused intraoperatively. Moreover, in almost half of the cases 2 units were requested, only 1 was cross-matched (84/177 cases, 47.5%). No case was postponed because the cross matched blood units were less than requested. Hence, C/T deviation from the desired 2.5 could be interpreted as an increased order of blood units by surgeons, as well as, a high number of cross-matched units-although lesser- by the blood bank.

Conclusion: C/T requested= 6.84, C/T= 5.35 indices are higher than the expected C/T ratio ≤2.5. This is due to lack of MSBOS and a transfusion committee that would ensure compliance to MSBOS in clinical practice. Application of the above could reduce unnecessary hospital expenses and the workload of blood bank personnel.

Delayed epidural catheter removal due to acquired coagulation abnormalities after cytoreductive surgery and hyperthermic intraperitoneal chemotherapy: a case report

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Background: Cytoreductive surgery and hyperthermic intraperitoneal chemotherapy (CRS-HIPEC) are associated with massive fluid shifts, bleeding and surgery-induced activation of hemostasis¹. Pain control and coagulation abnormalities are frequent challenges in the early postoperative period (PO).

Case Report: A 48 years-old, 50 kg, female underwent CRS-HIPEC for mucinous appendiceal neoplasm. A combined epidural-general anesthesia was used, and an epidural catheter was placed at T12-L1 for postoperative patient-controlled analgesia. A minimally invasive cardiac output monitor was installed to guide goal-directed hemodynamic therapy (GDHT). Surgery consisted of peritonectomy of abdominal wall and diaphragm, hepatic lobe capsule resection and ileocolectomy. A pneumothorax aggravated the hemodynamic instability during CRS-HIPEC. GDHT demanded 9 L of Plasma-Lyte®, 3.6 L of 5% human albumin, 1 unit of PRBC's and norepinephrine infusion. Blood loss estimated: 1.7 L. Severe pain during the first two PO days required an infusion of 244 mL of epidural solution (Ropivacaine 0.1% and Fentanyl 4 μg/mL) and 5 on-demand boluses. Epidural catheter was planned to be removed after 48h, but coagulation lab abnormalities (INR: 2.25; aPTT ratio: 2.0; Platelet: 298k/µL) delayed it. Coagulation status spontaneously normalized after 61h and catheter was uneventfully removed.

Discussion: Postoperative thoracic epidural analgesia is strongly recommended in ERAS pathways for CRS-HIPEC procedures². Coagulation abnormalities are a frequent finding after these surgeries and may last up to 10 days¹, posing an issue for catheter removal. Such risk–benefit assessment should integrate usual preoperative planning and must be decided on a case-by-case basis. **References:**

1. Lundbech, M, Damsbo, M, Krag, AE, et al. Changes in coagulation in cancer patients undergoing cytoreductive surgery with hyperthermic intraperitoneal chemotherapy treatment: A systematic review. Semin Thromb Hemost. 2024; 50(3):474-488.

2. Hübner M, Kusamura S, Villeneuve L, et al. Guidelines for Perioperative Care in Cytoreductive Surgery with or without hyperthermic Intraperitoneal chemotherapy: ERAS® Society Recommendations - Part II: Postoperative management and special considerations. Eur J Surg Oncol. 2020;46(12):2311-2323.

Learning points: Risk-benefit assessment of epidural catheters should integrate preoperative planning of surgeries in which early postoperative coagulation abnormalities are expected to occur.

43AP04-8

Prevalence of protein S deficiency in Japanese patients with newly developed deep vein thrombosis after surgery

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Background and Goal of Study: Venous thromboembolism (VTE) remains a serious complication that can arise even with the use of standard prophylaxis. The exact cause of this phenomenon remains unclear; however, it may be associated with protein S deficiency in Asia, including Japan (1). In this study, we examined the association between a decrease in the total and specific protein S activity, which is a risk factor for venous thrombosis, and newly developed VTE after surgery.

Materials and Methods: This prospective multicentre observational study was approved by the Ethics Committee (IRB No.22127-02), and registered in the UMIN-CTR Clinical Trial Database (ID: UMIN000051555). From January 2023 to September 2024, we targeted patients who underwent non-cardiac surgery at our hospital and affiliated research facilities and subsequently developed new VTE postoperatively. After obtaining written consent from the patients, the total protein S activity and its specific activity (protein S ratio activity: total activity/Protein S amount) were measured in patients with new VTE.

Results and Discussion: Of approximately 45,000 patients, 15 (0.03%) developed new VTE after surgery. Among these, two patients exhibited reduced total protein S activity and two showed reduced protein S ratio activity, totaling four cases (27%). Thirty-two percent of Japanese patients with VTE have at least one genetic defect. Additionally, mutations in the protein S gene are 5–10 times more frequent in Japanese patients compared with Caucasians. Protein S activity is reported to decline by 2–3% in the general population (1, 2). These findings suggest a significant relationship between decreased protein S activity and the development of VTE in Japanese patients undergoing surgery, despite standard precautions.

Conclusion(s): In Japanese patients with new postoperative VTE, total or specific protein S activity was reduced, suggesting that protein S deficiency may contribute to the development of VTE in this population.

Reference: 1. Thromb Res. 2009 ;124(1):14-8. (2) Clin Biochem. 2005 ;38(10):908-15

Acknowledgements: We would like to express my gratitude to the hospitals of the following joint research institutes: Kyushu Medical Center; St. Mary's hospital; Saiseikai Fukuoka General Hospital; JCHO Kyushu Hospital; Takagi Hospital

Assistance with the article: The authors would like to thank Editage (www.editage.jp) for English language editing.

A case of hysteroscopic intravascular absorption (OHIA) syndrome caused by saline in the irrigation fluid during high-risk hysteroscopic myomectomy requiring intensive care management

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Background: hysteroscopic myomectomy is a key option for improving fertility and preserving the uterus, with increasing demand. While bipolar devices mitigate risks of hypotonic solutions. the use of isotonic fluids at high perfusion pressures still poses a risk of fluid absorption, potentially leading to severe complications such as isotonic water intoxication. Proper intraoperative monitoring and fluid management are critical.

Case report: A 48-year-old woman underwent hysteroscopic myomectomy under general anesthesia for infertility treatment. During the procedure, she developed hypothermia, reduced SpO2, neck edema, and abdominal distention. Suspecting anaphylaxis or uterine perforation, ultrasound was performed, ruling out rupture. The underlying issue was excessive perfusion fluid absorption due to prolonged use and inadequate recovery. This resulted in systemic edema, pulmonary congestion, hypochromic anemia, and hyperchloric acidosis.

Postoperative treatment involved diuretics, leading to the removal of 6000 mL of fluid. Electrolyte balance was restored, and the patient regained consciousness on the same evening. She was extubated the following day and discharged without complications on postoperative day 4.

Discussion: Operative Hysteroscopic Intravascular Absorption (OHIA) syndrome occurs when perfusion fluid is absorbed into the systemic circulation during hysteroscopy, causing electrolyte imbalances, pulmonary edema, and circulatory disturbances. Bipolar devices using isotonic solutions reduce risks compared to monopolar devices and hypotonic fluids, but complications remain possible.

Anesthesiologists play an important role in the detection and management of OHIA syndrome. Supraglottic devices are commonly used for short procedures such as hysteroscopy, but early intubation should be considered if laryngeal edema or other airway complications are observed. To detect and treat abnormalities early, comprehensive monitoring of the patient's body fluids as well as their general condition during surgery is essential.

References:

- 1. Japanese Society of Gynecologic Endoscopy Guidelines, 2018, pp. 112-113.
- 2. Propst AM, et al. Obstet Gynecol. 2000;96:517-520.
- 3. Gonçalves TN, et al. Eur J Case Rep Intern Med. 2023;10(11):004132.

Learning points: This case shows that comprehensive monitoring and early detection are important for preventing and dealing with complications caused by isotonic fluid during hysteroscopic surgery.

43AP04-10

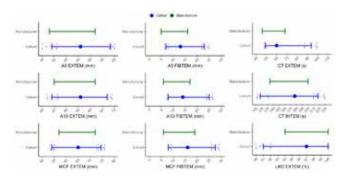
Preoperative reference ranges for ROTEM Sigma in cardiac surgery patients - a single-centre prospective observational study

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Background and Goal of Study: Rotational thromboelastometry (ROTEM) is widely used in cardiac surgery. ROTEM reference ranges are now derived from healthy volunteers but may not be interchangeable with those from cardiac surgery patients. Furthermore, sex and age seem to influence ROTEM profiles. This study establishes preoperative ROTEM Sigma reference ranges for adult cardiac surgery patients and examines sex- and agespecific variations.

Materials and Methods: The reference ranges (lower limit = 2.5th percentile, upper limit = 97.5th percentile) in this cohort were compared to the manufacturer's (based on 120 samples from healthy volunteers) by calculating 95% confidence intervals (CIs). If the Cls did not overlap with the manufacturer's limits, the reference ranges were considered statistically different.

Results and Discussion: The study included 381 patients and found notable differences in ROTEM reference ranges compared to the manufacturer's (Figure 1). The upper limits for amplitude parameters in EXTEM and FIBTEM were higher, and clotting time ranges in EXTEM and INTEM were wider. The lower limit of LI60 EXTEM was lower than the manufacturer's value. When comparing medians of ROTEM variables of males (n=260) with females (n=121), females had shorter CT EXTEM (3 s. 95% CI 1 to 5), higher A5 (3 mm, 95% CI 2 to 5), A10 (3 mm, 95% CI 2 to 4) and MCF (3 mm, 95% CI 2 to 4) EXTEM, higher A5 (2 mm, 95% CI 1 to 2), A10 (2 mm, 95% CI 1 to 3) and MCF (2 mm, 95% CI 1 to 3) FIBTEM. However, the bounds of the reference ranges of females were not statistically different to those of males. When comparing four age categories, divided by the quartiles (<58, 58-66, 67-73, >73), no differences in medians or in the reference bounds were found. Conclusion(s): Reference ranges for the total cohort differed from the manufacturer's reference ranges based on results from healthy volunteers. Preoperatively, females exhibited a slightly more hypercoagulable ROTEM profile than males when comparing medians, though the reference ranges were similar to males. No differences were found across age categories. Cardiovascular-specific, but not sex- or age-specific, ROTEM reference ranges might be needed.



A new human fibrinogen concentrate for the management of severe bleeding in patients undergoing major spinal or abdominal surgery: the AdFIrst prospective, randomized study

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Background and Goal of Study: Fibrinogen levels decrease during excessive bleeding in complex surgeries, requiring a quick replacement to manage bleeding effectively. To achieve it, supplementation with human fibrinogen concentrate (HFC), cryoprecipitate (cryo) or fresh frozen plasma (FFP) is recommended. To determine whether HFC is non-inferior to standard of care (FFP/ cryo) for managing intraoperative bleeding during surgeries.

Materials and Methods: The AdFIrst was a phase 3, prospective, randomized, active-controlled, multicenter, partially blinded, non-inferiority trial conducted at 15 European sites. Patients with severe bleeding undergoing major spinal or abdominal surgery with clinically relevant blood loss were randomized (1:1) for intravenous administration of either HFC (BT524, Biotest) versus FFP or cryoprecipitate. Primary endpoint was intra-operative blood loss from the decision to treat to the end of the surgery, with a non-inferiority margin of 150 mL in reducing blood loss. Secondary endpoints were the percentage of patients that successfully corrected fibrinogen levels and the time to achieve the correction, measured by FIBTEM A10.

Results and Discussion: Baseline fibringen levels were similar between groups. Patients received either HFC (n=107) or FFP/ cryo (n=104). In a sensitivity analysis of the modified full analysis set, least square mean (95% CI) intraoperative blood loss was -1432.58 (1237.20-1627.95) mL, HFC group, and 1607.63 (1409.61-1805.66) mL, FFP/cryo group (p<0.001), indicating noninferiority of HFC vs FFP/cryo and confirming the primary analysis. The mean duration of first infusion and the time to start of first infusion after decision to treat was shorter in the HFC (7.1 and 40.3 min, respectively) vs FFP/cryo group (33.1 and 69.0 min, respectively). After 15 min of infusion, the HFC group had higher fibrinogen levels than FFP/cryo and 59 (55.1%) patients achieved successful correction of fibrinogen levels vs 19 (18.3%) patients in the FFP/cryo group. Overall, a higher proportion of patients successfully corrected fibrinogen levels in the HFC (81.3%) vs FFP/ cryo (44.2%) groups (p<0.001).

Conclusion(s): HFC was efficacious as an early treatment maintaining hemostasis during intra-operative bleeding in patients undergoing major surgeries. In the HFC group, this was achieved through an effective increase and maintenance of fibrinogen levels and a shorter time to fibrinogen level correction compared to standard of care.

43AP04-12

Rethinking blood transfusion in critical care: insights from a retrospective observational study

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Background and Gool of study: Blood transfusion is a widespread practice in critical care units (CCU), but it is associated with higher morbidity, and longer hospital stay. The correct transfusion trigger has been widely discussed in the literature, with experts recommending a hemoglobin (Hb) threshold of 8 g/dL, although other patient factors can introduce variability in transfusion indications. The objective of this study was to determine the transfusion rate, transfusion index, and transfusion trigger in patients admitted to our CCU.

Materials and Methods: Data from patients admitted from January 1 and December 31, 2023 were collected. For the adequation and variability we analysed the haemoglobin just before the first transfusion during the admission. Data analysis was descriptive. The hospital's ethic committee approved the study.

Results and Discussion: 469 patients were admitted to the CCU. The transfusion rate was 31,6% (148 patients). Difference between groups is resumed in Table 1.

	Transfused (n=148)	No transfused (n=321)
Age (yrs)	67(19-88)	53.2 (19-90)
Male	72.3 %	69,16 %
Weight (kg)	75 (45-129)	75(52-170)
Hight (cm)	170 (92-185)	170 (135-185)
BMI	26,84 (17-53)	26.3(19-40)
SAPS3	59.5 (40-79)	40(11-94)
Surgery before admission	47.3 %	40.81 %
Hb<13 g/dL when admission	85.14%	59.19 %
Hb trigger (g/dL)	7.9 (4-11.4)	-
Transfusion index (units)	2 (1-20)	-
Iron treatment	14.86 %	1.87 %
Ingress mortality	11.49 %	2.8 %
Length of stay (days)	23 (1-254)	9 (0-174)

Table 1. Data are presented as median (IQR), or percentage.

Conclusion: Our findings confirm that transfused critical care patients have higher SAPS3 scores, longer hospital stays and the transfusion rate of 31.6%, slightly higher than other larger cohorts (1). The median haemoglobin trigger of 7.9 g/dL adheres to recommended thresholds. However the low rate of iron treatment underscores the need for better anaemia management strategies to further minimize transfusion-related risks and improve patient outcomes. However, the study has limitations due to its retrospective design and the lack of proper electronic medical record documentation.

Reference:

1. Raasveld SJ, et al. Red blood cell transfusion in the intensive care unit. JAMA. 2023:329(5):367-377. doi:10.1001/ jama.2023.2073.

43AP05-1

Evaluation of coagulation factors in patients undergoing pancreatic cancer surgery with curative intent; preliminary results from a prospective observational study

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Background and Goal of Study: Pancreatic cancer is probably the most thrombotic malignancy, with an incidence of venous thromboembolism (VTE) of up to 18%. Our aim was to assess the perioperative coagulation status of patients undergoing pancreatectomy due to pancreatic cancer.

Materials and Methods: This prospective observational study (NCT05964621) included patients with primary pancreatic cancer (resectable or borderline resectable, NCCN 2.2023) who underwent pancreatectomy under general anaesthesia. Three blood samples were taken (preoperatively, immediately after surgery, and before discharge) and the values of the following parameters were determined: von Willebrand factor (vWF), factors VIII and XI, Adamts-13 and anti-Xa. Perioperative care was provided by the same medical team and low-molecular-weight-heparin was routinely administered in accordance with institutional guidelines. Repeated measurements of coagulation factors were analysed using the Anova Repeated Measures Test (Tukey's multiple comparisons tests). Normally distributed values are expressed as mean (SD), non-normally distributed values as median and interquartile range (IQR).

Results and Discussion: At this preliminary analysis, fifteen consecutive patients with a mean (SD) age of 72 (±5) years were included. The majority of patients (8/15) underwent Whipple procedure, 5 patients total pancreatectomy and only 2 subtotal pancreatectomy, respectively. Eight patients were classified as ASA-PS III and the rest of them as II. The mean (SD) operation time was 247 (±60) minutes. For Adamts-13, there were significant differences between the preoperative, early (p=0.005) and late postoperative values (p=0.0005). Furthermore, for factor VIII, there was a significant difference between the preoperative and early postoperative values (p=0.02). However, perioperatively there were no significant differences for vWF (p=0.10) and factor XI (p=0.34). Due to the small number of patients, no multivariable regression analysis was performed.

Conclusion(s): According to our preliminary results, in patients who underwent pancreatectomy there were significant differences between the preoperative and postoperative values for Adamts-13 and factor VIII, respectively.

Acknowledgements: NCT05964621. Registered on 2023 clinicaltrials.org

43AP05-2

The relationship between capillary leak index and coagulation parameters as indicators of endothelial dysfunction in critically ill patients

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Background and Goal of Study: An acute inflammatory injury and profound hypoperfusion initiate a cascade of proinflammatory mediators leading to endothelial damage, which is often present in critically ill patients with sepsis, trauma, and after cardiac arrest. Endothelial injury results primarily in capillary leak and may also lead to coagulopathy. The capillary leak index (CLI), calculated as serum C-reactive protein level divided by serum albumin level, has been shown to be an effective predictor of endothelial dysfunction in critically ill patients including those with sepsis, trauma or cardiac arrest. Viscoelastic hemostatic assays (VHA), have proven to be comprehensive tools for detecting coagulopathies and, in some cases, appear to be superior to classic coagulation tests (CCTs). However, the relationship between CLI, CCTs and VHA parameters has not been studied extensively.

The aim of this study was to evaluate the relationship between CLI, CCTs and VHA parameters (measured by ROTEM®) in critically ill patients with sepsis, trauma or after cardiac arrest.

Materials and Methods: We conducted a retrospective, singlecenter observational study including consecutive, adult patients admitted to the ICU in the University Hospital in Krakow. Poland from January 2020 to December 2023 with diagnosis of sepsis. trauma, or cardiac arrest who had measured CLI, CCTs and VHA within the first 72 hours since ICU admission. The associations between the CLI, CCTs and VHA results were analyzed using Spearman's rank-order correlation.

Results and Discussion: This study included 114 patients (76 males [66.67%]) median age, 50.0 years [IQR: 34.00-64.25], median APACHE II score 27.0 [IQR: 22.0-32.0]). Among analyzed CCTs parameters a significant correlation was found between CLI and prothrombin time and fibrinogen (r=-0.441, p<0.001 and r=0.767, p<0.001, respectively). Among VHA parameters, the significant correlations were observed between CLI and MCF FIBTEM, CFT FIBTEM, MCF EXTEM, CFT EXTEM, MCF IN-TEM, CFT INTEM, (r=0.645, p<0.001; r=0.632, p<0.001; r=0.505, p<0.001; r=-0.522, p<0.001; r=0.510, p<0.001, r=-0.487, p<0.001, respectively).

Conclusion(s): There is a pathophysiologic rationale indicating that endothelial dysfunction in critically ill patients is related to coagulopathy and the significant correlations between CLI and both CCTs and VHA confirm it. Thus, the coagulation tests may serve as indirect markers of endothelial dysfunction.

43AP05-3

Intraoperative anticoagulation in patients with Heparin-induced Thrombocytopenia type II undergoing vascular surgery

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Background: HIT is an adverse effect diagnosed in patients exposed to heparin, characterized by thrombocytopenia and thrombosis, it leads to significant morbidity and mortality. Its estimated incidence is around 0.5-1% and poses a challenge in the management of intraoperative anticoagulation.

Case Report: A 59-year-old post-CABG patient presented with acute right lower limb ischemia, rhabdomyolysis, and cardiogenic shock, requiring VA-ECMO implantation and axillofemoral bypass surgery.

On the 5th day of ECMO support, the patient developed progressive thrombocytopenia down to 20,000/µL and tested positive for anti-PF4 antibodies, confirming a diagnosis of HIT type II. After 20 days, with recovered platelet levels and the patient hemodynamically stable off ECMO, surgery was scheduled for the removal of the infected axillofemoral bypass and limb revascularization.

Under general anesthesia, intraoperative anticoagulation was managed with argatroban, starting at 1 mcg/kg/min. After 40 minutes, an activated clotting time (ACT) of 176 ms (aPTT 1.8) was achieved; at 80 minutes, ACT was 180 ms (aPTT 2.24). Anticoagulation was maintained within therapeutic ranges for the 4-hour procedure without need for dose adjustment.

The surgery involved bilateral femoral thromboendarterectomy and endovascular treatment of the iliac arteries. Postoperative anticoagulation with fondaparinux was continued, and no HIT recurrence occurred.

Discussion: In patients with HIT requiring intraoperative anticoagulation, platelet count, anti-PF4 antibodies, and functional platelet testing are recommended. Patients with normal platelet counts and a negative serotonin release assay, regardless of anti-PF4 status, may receive intraoperative heparin.

In all other cases, surgery should be delayed or alternative anticoagulants such as argatroban or bivalirudin should be used, plasmapheresis or heparin + antiplatelet agents might be considered. Based on institutional experience, argatroban was chosen for its short half-life, aPTT-guided monitoring, and hepatic metabolism, achieving stable intraoperative anticoagulation with favorable outcomes.

Reference:

Heparin-Induced Thrombocytopenia and Cardiovascular Surgery. Hematology Am Soc Hematol Educ Program 2021;2021:536-44. Learning Points: Anesthesiologists should be familiar with intraoperative anticoagulation alternatives to heparin, and protocols should be established for managing patients with HIT undergoing vascular and cardiac procedures.

43AP05-4

Use of human fibrinogen replacement therapy for the management of postpartum hemorrhage in a patient with congenital hypofibrinogenemia and prothrombin gene deficiency

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Background: Congenital hypofibrinogenemia is a rare coagulation disorder characterized by Clauss fibrinogen levels <150 mg/ dL, which significantly increases the risk of bleeding, especially during childbirth (1). Human fibrinogen replacement therapy is the best option for achieving hemostasis and ensuring successful pregnancy outcomes. (1)

Case Report: A 36-year-old woman with congenital hypofibrinogenemia, prothrombin gene deficiency, and a history of four recurrent miscarriages carried a twin pregnancy to 37+2 weeks. Starting at 14 weeks, fibrinogen replacement therapy was initiated due to low plasma Clauss fibrinogen levels, increasing to 8 g weekly in the third trimester. She underwent an elective cesarean section under spinal anesthesia, which proceeded uneventfully. Two hours post-cesarean, the patient experienced severe postpartum hemorrhage (3,000 mL). Guided by thromboelastogram (TEG) results, management included 5 g of fibrinogen and 2 g of tranexamic acid. In the ICU, fibrinogen was administered every 8 hours for 24 hours to maintain Clauss fibrinogen levels above 150 mg/dL. The patient was safely extubated 36 hours later.

Discussion: Congenital hypofibrinogenemia is a rare yet critical disorder that poses significant anesthetic challenges, particularly in obstetric scenarios such as postpartum hemorrhage. TEGguided fibrinogen replacement therapy enables real-time coagulation monitoring and tailored treatment, imperative for reaching stability in such crucial scenarios. The anesthesia team's vigilant monitoring and management throughout pregnancy were pivotal in ensuring a successful pregnancy outcome.

Reference:

1. Brunclikova M, Simurda T, Zolkova J, Sterankova M, Skornova I, Dobrotova M, et al. Heterogeneity of genotype-phenotype in congenital hypofibrinogenemia-A review of case reports associated with bleeding and thrombosis. J Clin Med [Internet]. 2022;11(4):1083. Disponible en: http://dx.doi.org/10.3390/ jcm11041083

Learning Points: Congenital hypofibrinogenemia is a rare coagulation disorder that requires specialized management and careful monitoring, particularly in the obstetric setting. Clauss fibrinogen replacement therapy, guided by TEG, is essential for managing congenital hypofibrinogenemia and postpartum hemorrhage. Anesthesia plays a crucial role in the successful management of rare coagulation disorders with tailored interventions ensuring hemodynamic stability and optimal outcomes for both the mother and the neonate.

43AP05-5

Lisboa, Portugal

Meningioma excision and defect reconstruction in a Jehovah's Witness - case report

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Background: Jehovah's Witness patients pose unique challenges in blood management during surgeries with high hemorrhage risk. due to the refusal of blood products. 1. This case report highlights the successful multidisciplinary management of a meningioma resection and reconstruction, balancing religious beliefs and medical requirements.

Case Report: 37-year-old male Jehovah's Witness, with no significant medical history, presented with meningioma of the right great wing of the sphenoid and ocular extrusion. Due to the potentially high hemorragic risk a multidisciplinary team including anesthesiologists, surgeons and immunohematologists discussed the available options with the patient and his family. Cell saver technology was accepted. The 14-hour procedure involved CENS with meningioma excision, right orbit exenteration and recontruction with Duragen underlay, fascia lata, and frontal and bilateral nasoseptal flap, performed under total intravenous anesthesia. Permissive hipotension was prefered and intraoperative blood loss was approximately 1100 mL, 350 mL of salvaged blood were reinfused. The patient remained hemodynamically stable throughout, with no significant complications. Postoperative recovery was uneventful.

Discussion: This case underscores the importance of tailored surgical and blood management strategies in Jehovah's Witness patients. The cell saver effectively mitigated the risk of severe anemia without violating the patient's religious beliefs. The literature supports the utility of cell saver systems in neurosurgical procedures, which carry high hemorrhagic risks. 2. The case highlights the necessity of multidisciplinary planning and individualized care for complex surgical cases.

References:

- 1. Rashid M, Kromah F, Cooper C. Blood transfusion and alternatives in Jehovah's Witness patients. Curr Opin Anaesthesiol. 2021 Apr 1;34(2):125-130.
- 2. Cataldi S, Bruder N, Dufour H, Lefevre P, Grisoli F, François G. Intraoperative autologous blood transfusion in intracranial surgery. Neurosurgery. 1997 Apr;40(4):765-71; discussion 771-2. doi: 10.1097/00006123-199704000-00021. PMID: 9092850.

Learning points: Comprehensive preoperative planning is crucial for managing potential hemorrhagic complications in neurosurgical procedures. Multidisciplinary planning is essential for managing high-risk surgeries in Jehovah's Witness patients. Cell saver technology allows for effective intraoperative blood conservation while respecting religious beliefs.

43AP05-6 Comparative study of Quantra® with ROTEM **DELTA®** in cardiac surgery

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Background and Goal of Study: Cardiac surgery with extracorporeal circulation (ECC) poses a challenge for hemostatic mechanisms. It is the type of surgery with the highest incidence of postoperative bleeding. In this context, viscoelastic tests (ROTEM DELTA® and QUANTRA®) have proven to be a dynamic, rapid, and precise method for assessing hemostasis. According to the literature, QUANTRA® may provide advantages over ROTEM DELTA®. The main objective of this study is to evaluate the correlation and agreement between the QUANTRA® analyzer and the ROTEM DELTA® system in patients undergoing cardiac surgery with ECC.

Materials and Methods: This is a prospective, multicenter observational study. Sequential recruitment was conducted. A sample size of 25 was estimated for a minimum correlation of 0.7. Patients who did not adequately discontinue anticoagulation and/or antiplatelet therapy were excluded.

Results and Discussion: 30 patients were recruited. Tables 1 and 2 show the results obtained for correlation and coincidence.

Correlations	R	p-valor
СТ НЕРТЕМ / СТН	0,464	0,010
A10 FITBEM / FCS	0,756	< 0,001
A10 EXTEM / CS	0,619	< 0,001

Table 1. Correlations results.

Reference		Coincidence	SEN	ESP	VPP	VPN	P
Equivalencia							
CT HEPTEM > 240	CTH > 153	10 (33,3 %)	1,000	0,259	0,130	1,000	0,333
A10 EXTEM < 43	CS < 13	26 (86,7 %)	0,000	0,897	0,000	0,963	0,867
A10 FIBTEM < 7	FCS < 1	29 (96,7 %)	0,000	1,000	IND	0,967	0,967
ROTEM							
TTPa > 35	CT HEPTEM > 240	26 (86,7 %)	0,400	0,960	0,667	0,889	0,867
Plaquetas < 150	A10 EXTEM < 43	15 (50,0 %)	0,063	1,000	1,000	0,483	0,500
Fibrinógeno < 200	A10 FIBTEM < 7	28 (93,3 %)	0,000	0,966	0,000	0,966	0,93
Fibrinógeno < 200	A10 EXTEM < 43	30 (100,0 %)	1,000	1,000	1,000	1,000	1,000
Sangrado	RS (ROTEM)	17 (56,7 %)	0,200	0,933	0,750	0,538	0,56
QUANTRA							
TTPa > 35	CTH > 153	10 (33,3 %)	0,800	0,240	0,174	0,857	0,33
Plaquetas < 150	CS < 13	15 (50,0 %)	0,125	0,929	0,667	0,481	0,50
Plaquetas < 150	PCS < 11,9	17 (56,7 %)	0,375	0,786	0,667	0,524	0,56
Fibrinógeno < 200	FCS < 1	29 (96,7 %)	0,000	1,000	IND	0,967	0,96
Fibrinógeno < 200	CS < 13	26 (86,7 %)	0,000	0,897	0,000	0,963	0,86
Sangrado	RS (QUANTRA)	14 (45,7 %)	0,867	0,067	0,481	0,333	0,46

Table 2. Coincidence results.

Conclusion(s):

- 1. The measurements from both systems show a significant correlation, at least of a moderate degree.
- 2. The A10 of the EXTEM from the ROTEM DELTA®, followed by the CS of the QUANTRA®, are the best indicators in our sample for predicting low platelet count in the postoperative period.
- 3. The prediction of postoperative bleeding showed low accuracy, with the QUANTRA® device being more sensitive compared to the ROTEM DELTA®.
- 4. New studies are needed to predict clinically significant hemostatic alterations related to postoperative bleeding.

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Acknowledgements:

We thank the San Rafael Foundation for the funding obtained for this study.

43AP05-7

Red cell ordering practices for trauma and orthopaedic patients not requiring transfusions at the Royal Alexandra Hospital, NHS Scotland

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Background and Goal of Study: The Scottish National Blood Transfusion Service have issued 5 notices of unprecedentedly low levels of blood stocks in the last year. The Maximum Surgical Blood Ordering Schedule (MSBOS) is a guideline for ordering blood pre-operatively. The only Trauma and Orthopaedic (T&O) procedure for which MSBOS recommends ordering red blood cells (RBCs) is a revision total hip replacement.

To facilitate targeted awareness-raising of MSBOS recommendations, we assessed the characteristics of patients undergoing T&O procedures at Royal Alexandra Hospital (RAH) who had RBCs crossmatched but no transfusions between August and December 2023.

Materials and Methods: A list of all patients who had RBCs crossmatched in 2023 at RAH was obtained from the RAH Blood Transfusion Laboratory, and filtered to select patients who were under the care of T&O surgeons between August and December 2023. Details of patients' surgeries and crossmatch requests, and the presence of red cell antibodies were noted for each patient on a secure online spreadsheet within the NHS IT system. Analysis of patient and procedure characteristics were conducted using Excel.

Results and Discussion: Between August and December 2023, there were 146 crossmatch events for 82 patients under the care of T&O surgeons at RAH which did not require transfusion of any requested components. Of these events, 18 (12%) involved 1 crossmatched unit, 119 (82%) involved 2 units, 2 (1%) involved 3 units, and 7 (5%) involved 4 units, amounting to a total of 290 RBC units. 22 crossmatch events (15%) did not involve patients with RBC antibodies, which are associated with increased time required for the issue of RBCs. Only 6 crossmatch events (4%) were for temporary patient identification numbers, which dis-

proportionately represent acutely unwell patients who are not normally resident in the area or whose identity cannot be established. 82 (56%) events involved preoperative crossmatches for emergency surgery, and 3 (2%) events for elective surgery. Only 17 events (20% of all preoperative crossmatch events), amounting to 36 RBC units (20% of all RBC units issued preoperatively), were for revision total hip replacements.

Conclusion(s): Adherence to MSBOS may have prevented the preoperative crossmatch of up to 141 RBC units for T&O patients. Raising awareness of MSBOS among clinicians caring for T&O patients has significant potential to conserve blood transfusion resources.

*Both authors contributed equally as first authors.

43AP05-8

Cangrelor in the perioperative management of cardiac surgery: A strategy to minimize risks and optimize outcomes

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Background: Cangrelor is a reversible P2Y12 receptor inhibitor administered intravenously. It achieves platelet inhibition within two minutes, with effects dissipating one hour after discontinuation. A bolus of 30 mcg/kg is followed by a continuous infusion of 4 mcg/kg/min unless prior anti-P2Y12 therapy has been administered, in which case a dose of 0.75 mcg/kg/min is used after the washout period.

We present a case of acute coronary syndrome requiring percutaneous revascularization followed by coronary surgery. Cardiogenic shock required an intra-aortic balloon pump (IABP), which led to a left femoral artery pseudoaneurysm. Cangrelor was used as bridging therapy until pseudoaneurysm embolization.

Case report: A 67-year-old hypertensive male presented with chest pain and electrocardiographic signs of acute ischemia. Coronary angiography revealed multivessel disease and a stent was placed in the right coronary artery. In the ICU, the patient required vasoactive drugs and an IABP. Tirofiban and oral aspirin were initiated. Seven days later, coronary revascularization surgery was performed. Postoperatively, cangrelor and aspirin were started and after 24 hours a pseudoaneurysm caused by the IABP was treated. Antiplatelet effects of cangrelor were monitored with the VerifyNow system. Figure 1 outlines the timeline of antiplatelet agents.

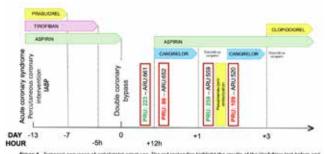


Figure 1. Temporal sequence of arreparent agent use. The red rectanges highlight the results of the verifyhole test before and after the initiation of cangellor, confirming effective platelet inhibition through the P2Y12 Reaction Units (PRU) values.

Discussion: Cangrelor offers immediate and reversible platelet inhibition, providing a safer alternative to oral agents. Its use enabled pseudoaneurysm treatment without compromising antiplatelet management after stenting. VerifyNow confirmed cangrelor's pharmacokinetics and clinical effectiveness.

Learning points:

- · Cangrelor's pharmacokinetics make its use ideal for patients at high risk of bleeding and thrombosis.
- VerifyNow allowed precise monitoring of antiplatelet effects.
- · Oral agents may be less safe than cangrelor in post-stenting cardiac surgery patients.

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43AP05-9

Efficacy and safety of hypertonic sodium lactate in the critical care setting: A systematic review and meta-analysis

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The use of hypertonic solution to improve fluid balance and hemodynamics has been investigated both in animal models and clinical practice and revealed some promising results.

The present research investigated the available evidence to determine the efficacy and safety of hypertonic sodium lactate (HSL) in critically ill patients. After a thorough search conducted on Medline, Pubmed, Embase, and Cochrane Library, from inception until September 30, 2023, five randomized controlled trials (RCTs) were selected, with a total of 405 patients, which compared HSL with other crystalloids in fluid management in this setting. Risk of Bias 2 (RoB2) tool was utilized to assess the risk of bias of each RCT included, while GRADEpro tool was used to evaluate the certainty of the evidence for the outcomes assessed. Mean difference (MD) was used for continuous outcomes, while risk ratio (RR) was used for dichotomous outcomes, both with 95% confidence interval (CI). Random-effects model was used for all analyses.

The findings indicate that HSL likely results in a significant increase in blood pH (MD 0.08, 0.04 - 0.13, 95% CI) and bicarbonate (HCO3-) (MD 9.06, 5.71-12.41 mmol/L, 95% CI). Moreover, HSL causes an increase in serum sodium (Na) (MD 2.99, 0.55-6.53 mmol/L, 95% CI) and a slight decrease in serum chloride (CI) (MD 4.69, 13.53-4.15 mmol/L, 95% CI). In addition, HSL may improve the hemodynamic status while reducing the fluid balance (moderate grade of evidence). These findings imply that HSL can be an alternative fluid therapy for critically ill patients. However, a larger cohort is required to confirm these results.

43AP05-10

Successful perioperative management of a patient with immune-mediated thrombotic thrombocytopenic purpura undergoing complex endovascular aneurysm repair of thoraco-abdominal aneurysm

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Background: Immune-mediated thrombotic thrombocytopenic purpura (iTTP) is a life-threatening syndrome, characterized by thrombotic microangiopathy with peripheral thrombocytopenia, microangiopathic haemolytic anaemia and organ failure of varying severity and reduced activity of Adamts-13. We present the successful perioperative management of a patient with iTTP who underwent complex endovascular aneurysm repair (EVAR) of a 5.2 cm thoraco-abdominal aneurysm (TAAA).

Case Report: A 68-year-old female, with newly diagnosed iTTP, presented for elective complex EVAR of a 5.2 cm TAAA. Preoperatively, according to haematological consultation, the disease went into remission [Adamts-13=65.4%. Haematocrit (Hct)=33%. Platelets (PLTs)= 361 x 109/L] and she was scheduled for complex EVAR with custom made fenestrated graft under general anaesthesia. Apart from basic monitoring, monitoring of invasive arterial blood pressure, of central venous pressure and of the depth of anaesthesia were applied. The surgery lasted for 230 minutes and the patient received 2000 ml of balanced crystalloid and two units of packed red blood cells. The intraoperative course was uneventful and she was extubated in the operating theater. On postoperative day 1 Hct was 32,8% and PLTs were 209.000 x 10°/L, respectively. On postoperative day 3 laboratory data showed a decrease on PLTs (162 x 109/L) and Adamts-13 (44,1%). The patient was discharged on the postoperative day 5, treated with acetylsalicylic acid 100mg o.d. and rivaroxaban 2.5mg b.d.

Discussion: Reduced Adamts-13 activity leads to pathological platelet adhesion and aggregation, diffuse small vessel occlusion, thrombotic episodes, and ischemia. The EVAR per se due to the usage of the guidewires may lead to injury to vessel walls and endothelial damage. Thus, we measured Adamts-13 activity perioperatively to assess the degree of impairment of endothelial function and the possibility of fatal iTTP recurrence. We performed the surgery after haematological consultation and when the disease went into remission (Adamts-13 levels within normal range). Postoperatively we re-evaluated the Adamts-13 levels and the patient was under close surveillance.

Learning points: The perioperative management of patients with iTTP who undergo complex endovascular aneurysm repair proves to be challenging. An appropriate preoperative management, a multidisciplinary approach, Adamts-13 evaluation and close postoperative surveillance are extremely important.

A tale of twos: AMI treated surgically and endovascularly in a patient with double heterozygosity for Factor V Leiden and Factor II mutations - Case report

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Background: Acute mesenteric ischemia (AMI) is a life-threatening condition caused by reduced intestinal blood flow. While rare, it has a high surgical mortality rate. Etiologies include mesenteric arterial embolism, arterial thrombosis (caused by atherosclerosis, vasculitis, or hypercoagulable states), and venous thrombosis (1). Case Report: We present the case of a 48-year-old Caucasian male with acute-onset abdominal pain. His medical history included bladder cancer, for which he underwent surgery a year prior. MSCT angiography confirmed AMI, prompting an emergency embolectomy of the superior mesenteric artery. Postoperatively, he was admitted to the ICU. The following day, follow-up MSCT angiography revealed re-thrombosis of the superior mesenteric artery and thrombosis of the celiac trunk. Emergency surgical revascularization was performed. The abdominal wall was left open. Continuous heparin infusion was initiated and adjusted via APTT. On postoperative day two, elevated transaminases prompted successful endovascular intervention with recanalizing the celiac trunk and stent placement. Dual antiplatelet therapy (IV acetylsalicylic acid and eptifibatide) was introduced. Hematologic evaluation identified double heterozygosity for Factor V Leiden (FVL) and prothrombin (FII) mutations. After multiple second-look surgeries, the abdominal wall was closed. The patient transitioned to the general ward and was discharged in good health after 30 days, with acetylsalicylic acid and rivaroxaban prescribed for long-term management.

Discussion: This case underscores two key considerations. First, while exceptionally rare, simultaneous heterozygosity for FVL and FII poses a thrombotic risk comparable to FVL homozygosity. Second, the need for dual antiplatelet therapy following stent placement in the context of an open abdominal wall highlights the challenges of balancing anticoagulation and surgical risks.

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Learning points: Given the impaired drug absorption associated with AMI, we opted for IV GPIIb/IIIa inhibitors, whose short action duration allows faster platelet recovery for potential future surgeries. As endovascular therapies become more common, cases like this will increase, emphasizing the urgent need for standardized, evidence-based guidelines.

43AP05-12

Effect of body mass index and sex differences on perioperative outcomes in hip surgery

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Background and Goal of Study: Hip fractures impact approximately 4.5 million adults globally, with higher incidence in women and those with lower BMI. This study aimed to evaluate the influence of sex and BMI on perioperative outcomes in hip fracture

Materials and Methods: A retrospective analysis of 626 patients undergoing unilateral hip fracture surgery (January 2020-September 2023) was performed. Patients were grouped by sex and BMI (underweight <18.5 kg/m²; normal 18.5-25.0 kg/m²; overweight 25.1-30.0 kg/m²; obese >30 kg/m²). Data collected included age, ASA scores, comorbidities, anticoagulant use, hemoglobin levels, transfusion requirements, symptoms of anemia, surgery duration, complications, LOS, and mortality. Statistical analysis included Mann-Whitney and χ^2 tests to compare medians and categorical variables.

Results and Discussion: The median patient age was 82 years (IQR 73-87). Women were older, had higher ASA scores (3-4), had a higher incidence of preoperative anemia, and required more transfusions. Men, despite fewer comorbidities, had longer LOS and comparable complication and mortality rates. Underweight patients had lower preoperative hemoglobin and, more often, symptoms of anemia. Obese patients underwent longer surgeries and LOS but no significant differences in complications or mortality. Anticoagulant use was linked to higher complication rates but did not affect mortality.

Conclusion(s): Women were generally sicker with higher anemia and transfusion needs, while men had similar perioperative outcomes despite appearing less ill. Obesity did not increase complications or mortality, aligning with the "obesity paradox," previously noted in various medical conditions.

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Hemorrhagic shock and disseminated intravascular coagulation following initial presentation of peritonsillar abscess: a case report

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Background: This case highlights the complexity and rapid progression of DIC and MOF in a previously healthy individual triggered by a seemingly localized infection.

Case Report: A previously healthy 38-year-old male was transferred to our emergency department from another hospital, presenting with hemorrhagic shock.

Initially, he had been admitted for a peritonsillar abscess. On the third day of hospitalization, despite goal-directed therapy, he developed progressive thrombocytopenia and elevated D-dimer levels. By the fifth day, his condition had worsened, with the onset of watery diarrhea, abdominal pain, abdominal wall distension, and rectorrhagia. Despite bleeding, on VEM, he was hypercoagulable. A CT pulmonary angiography revealed a segmental pulmonary embolism, while abdominal CT indicated mesenteric thrombosis with no signs of active contrast extravasation. Disseminated intravascular coagulation (DIC) was suspected. The combination of DIC, clinical signs of abdominal compartment syndrome, and progressive hemodynamic collapse necessitated urgent abdominal surgery. An ileal resection was performed during surgery, and a double-barrel ileostomy was created. Due to the inability to close the abdominal wall, a Bogota bag was placed. On the 1st postoperative day, CVVHD is started due to oliguria and protracted metabolic acidosis. A positive HIT test result on the fifth postoperative day prompted a switch to fondaparinux. However, due to the progression of disseminated intravascular coagulation (DIC) and multiorgan failure (MOF), coupled with worsening visceral perfusion, a subtotal colectomy, jejunal resection, and formation of a unipolar jejunostomy were performed on the seventh postoperative day.

Despite these intensive care interventions, the patient developed refractory hemodynamic instability and was unresponsive to maximal vasoactive support. The patient's condition further deteriorated, marked by absolute vasoplegia, fulminant liver failure, and ARDS, culminating in the patient's death on the eighth postoperative day.

Discussion: Despite aggressive management, including advanced critical care strategies such as plasmapheresis and CV-VHD, the patient's condition deteriorated rapidly, culminating in fulminant MOF and death.

Learning points: This report emphasizes the need for heightened vigilance in managing coagulopathies in critically ill patients and the potential for severe outcomes even with timely interventions.

43AP06-2 A case of treatment of hereditary coagulopathy

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Background: To describe a clinical case of a patient with a carrier of thrombophilia genes for MTFHR, MTRR, PAI-I d in homozygous form for FGB, ITGA2, ITGB3 in heterozygous form with moderate homocysteinemia.

Case Report: Patient T. 52 years in January 2024, she was admitted with a diagnosis of acute ascending varicothrombophlebitis (ARV) 18 mm from the left mouth, was hospitalized in the vascular department for crossectomy of ARV, the next day due to uterine bleeding on the background of large uterine fibroids of 3-4 types (according to FIGO) adenomyosis, endometrial pathology urgently solving the issue of endovascular hemostasis.

On the background of spinal anesthesia before the start of surgery, cardiac arrest by asystole type, CPR for 7 min with the restoration of an organized rhythm, surgical treatment is postponed until the condition stabilizes.

Parameter	1 day	3 day	6 day
INR	1.4	1.39	1.08
PTI, %	59.6	60.2	88.3
Fibrinogen, g/l	1.52	0.85	3.36
APTT, s	30.1	36.1	30.2
AT III,%	89	71	84
HGB, g/l	76	123	118
RBC	3.11	4.65	3.87
PLT	40	95	136
AST	2827	399	49
ALT	1433	600	201
GCS	3	3	6
SAPS II	53	54	21
SOFA	11	9	2
NRS 2002	3	6	2

Despite the positive dynamics, the patient had moderate serous discharge from the genital tract, while there was an increase in ischemia in the lower extremities in the area of the right foot at the level of the cuboid bone and the toes of the left foot, which, when the demarcation line appeared, required amputation of the right lower extremity at the level of the upper third of the leg and amputation of the toes of the left foot on the 14th day.

Learning points: After discharge (on the 35th day), it was revealed that she was a carrier of thrombophilia genes for MTFHR, MTRR, PAI-I d in homozygous form for FGB, ITGA2, ITGB3 in heterozygous form with moderate homocysteineemia in her and her brother.

The patient was re-hospitalized for endovascular embolization of the uterine arteries. The course of surgical treatment and anesthesia was without complications.

Perioperative coagulopathy management in adults underwent liver transplantation

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Background and Goal of Study: End-stage liver disease is always associated with severe coagulation disorders. Optimal coagulation management is the greatest challenge in liver transplantation anesthesia. Some pts after liver transplantation still need transfusions for many reasons.

The study aims to specify conditions when fresh frozen plasma (FFP) or cryoprecipitate (cryo) transfusions are used in pts underwent liver transplantation.

Materials and Methods: We studied 226 adult pts who underwent liver transplantation. APPT, PT, INR, FbgA, PLT, thromboelastography (K; R; α angle; MA; LY30), vol of FFP and cryo used perioperatively were studied.

Results and Discussion: 154 (68.1%) of pts had severe coagulopathy and active bleeding during surgery, these pts were transfused FFP, cryo, PLT, and concentrates of coagulation factors. Triggers were significant coagulopathy and bleeding. The mean vol of bleeding was 1312±1345.7 ml (1500-3500).

The trigger for FFP transfusion was blood loss over 1500 ml and coagulopathy with APPT 87.8±35.8 sec; PI 28.5±13.0%; INR 3.17±0.91; R 8.7±3.6 min; K 5.1±2.6 min.

The trigger for cryo transfusion was active bleeding over 1320 ml with a level of FbgA 0.56±0.74 g/l and α angle 44.0±14.2 deg. The trigger for PLT transfusion was active bleeding over 1850 ml with PLT 24.3±12.2×109/mcl and MA 24.6±10.8 mm.

The trigger for concentrates of coagulation factors were bleeding over 4720 ml and coagulopathy with APPT 98.7 \pm 45.2 sec; PI 18.4 \pm 19.8 %; INR 5.69 \pm 3.75; FGA 1.1 \pm 2.7 g/l; R 14.4 \pm 7.9 min; K 12.4 \pm 8.3 min; α angle 25.0 \pm 26.9 deg.

After surgery 12 (5.3%) of pts had severe coagulopathy and 8 (66.6%) of them had active bleeding, all these pts were transfused FFP and/or cryo. The coagulation tests showed APPT 102.5 \pm 57.2 sec, PT 19.6 \pm 10.8%, INR 5.7 \pm 4.2, FGA 0.7 \pm 1.0 g/l, R 9.2 \pm 1.8 min, K 12.1 \pm 4.6 min, α angle 31.5 \pm 13.0 degree, MA 30.9 \pm 8.0 mm, LY30 0.1 \pm 0.3%. The mean vol of FFP postoperatively was 3222.5 \pm 3274.8 (690-8650) ml. Cryo vol was 80 \pm 193.7 (0-600) ml. FFP and cryo transfused the first 72 h after surgery.

Conclusion(s): 68% of pts who underwent liver transplantation require coagulation factors replacement to control bleeding during surgery. 5.3% of pts after liver transplantation had severe coagulopathy and 66.6% of them had active bleeding.

In case of active bleeding and severe coagulopathy (APPT 102 sec, PT 19.6%, INR 5.7, R 9.2 min, K 12.1 min, α angle 31.5 deg.) FFP and/or cryo might be transfused.

43AP06-5

Development of data-driven clinical decision support tool for clinical assessment of ROTEM in cardiac surgery

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Background and Goal of Study: Bleeding complications during cardiac surgery are associated with morbidity and mortality. Point-of-care viscoelastic hemostatic assays, such as rotational thromboelastometry (ROTEM), provide critical insights into patient coagulation status. However, ROTEM interpretation is complex and requires training and experience. This study aimed to develop a prediction model that integrates ROTEM data with patient- and procedure-specific parameters to detect abnormalities and determine the necessity for intervention to ultimately support personalized clinical decision-making.

Materials and Methods: We prospectively collected ROTEM data of 190 patients during three pre-specified moments during elective cardiac surgery. Expert annotations served as the ground truth for training and validating predictive models. A comprehensive machine learning pipeline was developed to diagnose abnormalities and subsequently to determine the necessity of intervention. The final model was evaluated using nested cross-validation with metrics as F1-score and AUC.

Results and Discussion: The final model was able to diagnose abnormalities in ROTEM data with an F1-score of 0.81 (95% CI: 0.80 – 0.83) and AUC of 0.83 (95% CI: 0.83 – 0.85). Subsequent recommendation for intervention resulted in an F1-score of 0.63 (95% CI: 0.59 – 0.68) and AUC of 0.65 (95% CI: 0.61 – 0.71). CT INTEM and CT EXTEM were the most important parameters to detect abnormalities, while MAXV HEPTEM and ML HEPTEM were the most dependent parameters for recommending intervention. Besides model performance, explainability is a crucial aspect of clinical decision support. In clinical practice, such decision support should efficiently rule out abnormality, and thus intervention, to optimize coagulation strategy during cardiac surgery.

Conclusion(s): Clinical decision support using automated ROTEM interpretation effectively diagnoses abnormalities. However, further optimization is needed to enhance the accuracy of intervention recommendation.

Acknowledgements: We would like to thank the VHALID study group for annotating the data.

Intraoperative myocardial infarction with refractory cardiogenic shock and cardiac arrest during radical cystectomy: a case report of a critical event

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Background: Intraoperative myocardial infarction (MI) complicated by refractory cardiogenic shock and cardiac arrest is a critical event with serious repercussions on morbimortality.

Case report: 65-year-old male with multiple cardiovascular (CV) risk factors and non-ST elevation MI with 3 drug eluding stents 3 months earlier was scheduled for radical cystectomy due to bladder cancer. Cardiology was consulted and approved proceeding with surgery. Patient was asymptomatic, MET score>4, preoperative hemoglobin of 13g/dL, normal electrocardiogram (ECG) and echocardiographic ventricular function. Due to dual antiplatelet therapy, aspirin was maintained up to the surgery day and clopidogrel withheld 5 days prior. Intraoperative monitoring: ASA standard, invasive blood pressure and ProAQT/PulsioFlex® monitor. Despite 600 mL blood loss, anesthesia/surgery went without complications and with hemodynamic stability.

Near the end, ECG monitor showed ST-segment elevation, followed by refractory cardiogenic shock and cardiac arrest minutes after. Advanced cardiac life support was initiated, followed by extracorporeal membrane oxygenation (ECMO) support. Emergent coronariography showed stent thrombosis, and revascularization was done. Left ventricular dysfunction was irreversible, leading to the patient's death two days later.

Discussion: Despite fulfillment of the minimum timings recommended by European guidelines¹, perioperative management should consider factors such as surgical stage at the time of MI. bleeding risk, hemodynamic status and MI severity². This case highlights how challenging the management of intraoperative myocardial infarction with refractory cardiogenic shock and cardiac arrest can be. Appropriate intra-operative CV monitoring leads to early diagnosis and treatment.

This case triggers the discussion of whether these patients need to be done in an ECMO prepared center. Available literature remains limited, with only 2 similar cases found2,3.

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Learning points:

- Appropriate individual risk identification, preoperative CV evaluation and antiplatelet management is crucial.
- Anesthesiologists need to be trained and ready to act accordingly to critical events.

43AP06-7

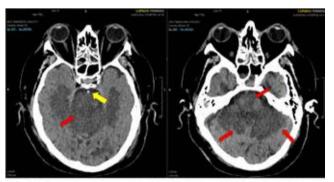
Basilar thrombosis after mitral valve surgery: challenges in anticoagulation initiation

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Background: Mitral valve replacement is a common procedure. but managing postoperative bleeding and thrombotic risks is challenging, especially in complicated cases. Delayed anticoagulation heightens the risk of thrombotic events, such as basilar artery thrombosis, presenting unique management dilemmas.

Case Report: A 56-year-old male with hypertension, dyslipidemia, obesity, smoking history, and mild COPD was treated for severe rheumatic mitral stenosis. After ruling out percutaneous valvuloplasty, he underwent mitral valve replacement with a mechanical prosthesis. Surgery was complicated by a prior Amplatzer device (2010), requiring complex valve exposure. Intraoperative challenges included instability and coagulopathy, preventing sternal closure. A temporary Bogota bag and sternal packing controlled bleeding.

Postoperatively, the patient developed mixed shock (vasoplegic and cardiogenic), needing mechanical ventilation, vasopressors, and inhaled nitric oxide. Anticoagulation was postponed due to bleeding risks. On postoperative day three, right-sided anisocoria occurred, and CT revealed basilar artery thrombosis with infarction affecting the pons, midbrain, and cerebral peduncles.



Discussion: This case underscores the delicate balance between preventing thrombotic events and managing bleeding risks postoperatively. Early anticoagulation is crucial but must align with the patient's clinical situation. In this case, delayed anticoagulation led to a devastating neurological outcome.

Despite stabilization and sternal closure, severe neurological damage was confirmed via somatosensory evoked potentials and EEG. Family discussions centered on the poor prognosis, leading to adjusted therapeutic efforts.

Learning Points:

- · Balancing anticoagulation after mitral valve replacement is critical amid bleeding risks.
- · Early anticoagulation helps prevent events like basilar artery thrombosis but requires individualization.
- Neurological monitoring and imaging are essential for detecting complications early.
- · Clear family communication aids decision-making in cases with poor outcomes.

Anesthetic and hemostatic management in total hip arthroplasty in a patient with hemophilia B: A case report

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Background: Hemophilia B is a rare coagulation disorder caused by factor IX deficiency, occurring in 1 in 20,000 males. Surgical procedures in these patients pose high bleeding risks. Advances in factor IX concentrates have reduced perioperative mortality from 25-50% to ~1%, yet management in severe cases remains under-documented.

Case Report: A 28-year-old male (173 cm, 65 kg) with severe Hemophilia B presented for left THA due to hemophilic arthropathy. His history included mild bleeding episodes treated with factor IX and no prior surgeries. Preoperative biweekly infusions of 2,000 IU factor IX achieved Hb of 12.9 g/dL and prolonged aPTT (46.6s). Thirty minutes before anesthesia, 6,000 IU factor IX and 750 mg tranexamic acid were administered.

General anesthesia was chosen to avoid spinal hematoma. Induction included lidocaine (1 mg/kg), propofol (2.5 mg/kg), fentanyl (1.5 µg/kg), and rocuronium (0.6 mg/kg), with propofol (5 mg/ kg/h) and remifentanil for maintenance. The 5-hour surgery was stable until significant bleeding during femoral canal reaming caused hemodynamic decompensation (MAP 80/40 mmHg, HR 120 bpm) and Hb drop to 9.4 g/dL. Intervention included 2,000 IU factor IX, arterial catheterization, and 3 red blood cell units.

Postoperatively, Hb fell to 7.0 g/dL, requiring 2 transfusions, ferric carboxymaltose, tranexamic acid, and 7,000 IU factor IX. By postoperative day 1, factor IX levels stabilized at 69.1 IU/dL, allowing transfer to the ward. Hemostatic management included 3,000 IU factor IX every 12 hours and tranexamic acid (750 mg/8 h). Discharge occurred on day 8 with stable Hb and daily factor IX (3.000 IU).

Discussion: General anesthesia minimized spinal hematoma risk, aligning with WFH guidelines. Factor IX concentrates, preferred over prothrombin complex concentrates (PCCs) due to thromboembolic risks, ensured effective hemostasis. Tranexamic acid reduced bleeding without increasing thrombotic risk, consistent with Dunn et al. (2015). Intensive monitoring and prompt intervention were critical for managing complications.

Learning Points:

- · Multidisciplinary planning is vital for Hemophilia B surgery.
- Factor IX concentrates and antifibrinolytics ensure effective hemostasis.
- · Early recognition and management of bleeding improve outcomes.

References:

1. Dunn A, et al. "Safety and efficacy of tranexamic acid in hemophilia." Haemophilia. 2015;21(5):590-7 2. World Federation of Hemophilia. "Guidelines for the Management of Hemophilia," 3rd ed. 2020

43AP06-9

Perioperative anticoagulation management for a patient undergoing cardiac surgery with a history of Heparin Induced Thrombocytopenia (HIT): a case report

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Background: Heparin Induced Thrombocytopenia (HIT) is an immune-mediated disorder in which heparin causes production of antibodies against the complexes formed between heparin and platelet factor-4 (PF4). Platelet count falls and paradoxically thrombosis is promoted. This results in a challenge for the management of patients undergoing cardiac surgery with extracorporeal circulation.

Case Report: A 65 year old female with a history of systemic lupus erythematosis, anti-phospholipid syndrome and HIT diagnosed in 1994 was scheduled for aortic valve replacement. Following multidisciplinary discussion and in line with American Society of Haematology 2018 guidelines, unfractionated heparin was administered for the surgery as the patient met the criteria of normal platelet count, >3 months since HIT diagnosis and undetected anti-PF4 antibodies.

In the immediate postoperative, veno-arterial extracorporeal membrane oxygenation (ECMO) was initiated for severe right ventricular failure (RVF). The patient also suffered a massive haemorrhage requiring polytransfusion and developed an acute kidney injury.

Following control of haemorrhage, anticoagulation was initiated with argatroban. On postoperative day (POD) 5, due to unsuccessful weaning of ECMO, right-sided VA-ECMO was initiated for ongoing severe RVF. On POD 9, in the absence of improvement, care was redirected to palliation.

Discussion: Heparin is the cornerstone of anticoagulation in cardiac surgery and ECMO. In patients with HIT, direct thrombin inhibitors argatroban and bivalirudin are first line alternatives. However, in the context of ECMO for patients with a history of HIT, there is a lack of guidance. Argatroban is recommended in patients with renal insufficiency due to its hepatic elimination, a half-life of 40 to 50 minutes and predictable dosing. Unlike bivalirudin whose elimination depends on creatinine clearance, having unstable dosing.

Reference:

Koster A, Nagler M, Erdoes G, Levy JH. Heparin-induced Thrombocytopenia: Perioperative Diagnosis and Management. Anesthesiology. 2022 Feb 1;136(2):336-344. doi: 10.1097/ ALN.0000000000004090. PMID: 34910815.

Learning points:

- The importance of multidisciplinary preoperative evaluation of complex patients.
- The choice of anticoagulation for a patient requiring ECMO with a history of HIT is multifactorial (pharmacokinetics, availability of local protocols).

Acquired factor XIII deficiency and postoperative bleeding events

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Background and Goal of Study: Persistent postoperative bleeding, with normal screening coagulation studies and no evidence of platelet deficiency and dysfunction in critical ill patients may be produced by acquired factor XIII deficiency (DAFXIII) . Low levels of factor XIII (FXIII) produce unstable clots with bleeding events. not detected by coagulation and viscoelastic tests. Acquired FXIII deficiency is related to clinical situations of hyper consumption like surgery or trauma. Our hypothesis is that acquired coagulation FX-III deficiency is underrepresented in the perioperative setting. Our aim is to assess transfusion requirements with FXIII levels.

Materials and Methods: We present a single-centre, retrospective observational study, of patients admitted to the postanaesthesia critical care unit with clinical situation of factor XIII consumption after trauma, major surgery (abdominal and major trauma), extracorporeal membrane therapy and major burn from January 2023 to January 2024, where FXIII levels were monitor. FXIII deficiency was described as levels <70% and moderate deficiency <30%. Blood product transfusion requirements and need of urgent reintervention for bleeding control was recorded. Results are represented as percentage for categorical data and as median and inter quartile range for non-normally distributed data. Chi-square statistical test was realized. A P value < 0.05 was considered statistically significant.

Results and Discussion: 17 postsurgical patients were included. 16 patients presented acquired factor FXIII deficiency (94%), 8 (47%) presented moderate deficiency. The median of FXIII levels in patients with acquired deficiency were 37.7%. Patients on ECMO therapy and patients with necrotizing fasciitis had lower FXIII levels <30%. The median of daily transfusion (number of packed red blood cells / days of admission in post anesthesia critical care) was 2±3.8 tduring hospitalization in patients with DAFXIII. The median transfusion in DAFXIII <30% was 34 CH, and DAFXIII >30% was 12 CH without reaching a significant difference (p= 0.19). 60% required surgical reintervention to control the bleeding, with no significant differences found between DAFXIII <30% (71.4%) and DAFXIII > 30% (44%). 5 patients (31%) with moderate DAFXIII <30% received FXIII replacement therapy. Mortality was 31%. Acquired factor deficiency is frequent during the postoperative setting. FXIII levels may decrease during postoperative days due to high consumption and low synthesis. FXIII has a long half life, involving late bleeding disorders unresponsive to coagulopathy treatment, or disturbed wound healing. Increasing blood product trasfusion, adverse events and morbi-mortality Conclusion(s): Acquired FXIII deficiency is an underdiagnosed entity during the perioperative process, being a cause of preventable postsurgical bleeding. High clinical suspicion is important in patients with delayed bleeding with normal coagulation tests. It is still not clear the cutoff of FXIII level to ensure a correct hemostasis, neither when to monitor or an optimal factor replacement.

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43AP06-11

Anesthetic management of a complex AAA with impending rupture in an anticoagulated patient for DVT and PE

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Background: Managing patients with impending rupture of abdominal aortic aneurysm (AAA) on anticoagulation for DVT and pulmonary embolism (PE) is challenging, with a precarious balance between life-threatening bleeding from the aneurysm and thromboembolic risks if AC is reversed. Anesthetic strategies must combine rapid BP stabilization, judicious blood product management, and correct timing of surgical intervention.

Case Report: A 70-year-old man w.h.o. severe smoking and hypertension was diagnosed with DVT after a long flight. Got admission for dyspnea & lower leg pain. CT revealed bilat. pulmonary emboli, pleural effusion, and ground-glass infiltrates. CKD-induced hyperkalemia was managed. Discharged on apixaban and antibiotics for respiratory infection.

Returned 10 days later with severe epigastralgia & constipation. Physical exam revealed a pulsatile mass. CT confirmed an infrarenal 8 x 7 cm AAA involving proximal right illiac artery. Hypertension was urgently treated, anticoagulation stopped, Kidney function optimized and EVAR was planned. Under general anesthesia, hemodynamic stability was maintained with hypnosis monitoring and GDHT to avoid hypoperfusion or overhydration. A perforated iliac artery required overlapping stents to control bleeding. Ventilatory challenges from COPD + infection were managed with PCV. permissive hypercapnia, corticoids. The patient was extubated in ICU, with good healing of inguinal hematoma, good distal perfusion and mobility without spinal ischemia. He was discharged on anticoagulation.

Discussion: Impending rupture of AAA carries high mortality, with survival <25% post-rupture. Multiorgan dysfunction, incl. kidney and respiratory issues is common. Thrombotic events and anticoagulation complicate perioperative course. POC coagulation tests are crucial for optimizing hemostasis.

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Learning points:

- Optimize kidney function perioperatively to prevent electrolyte imbalances & arrhythmia
- · Control BP to avoid AAA rupture.
- Use point-of-care coagulation tests to safely time the proce-
- Anesthesiologists play a key role managing these factors to prevent complications and improve survival.

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43AP06-12

Preoperative haemolysis in Evans syndrome

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Background: Evans Syndrome is an autoimmune disease combining Haemolytic Anaemia and Immune Thrombocytopenia. Perioperative management of these patients is challenging due to rapid onset cytopenia and need for corticosteroid therapy. We detail the management of a patient with Evans Syndrome with preoperative haemolysis.

Case Report: A 72-year-old female was diagnosed with a Rectum Neoplasia and scheduled for an Anterior Rectum Resection. On a pre-anaesthetic appointment, her history was relevant for Evans Syndrome, diagnosed 6 years prior with Thrombocytopenia and Haemolytic Anaemia. Bloodwork was unremarkable (Hg 13.2g/dL, Plat 114000/uL) under 5mg/d Prednisolone, being decided that the regimen should be maintained throughout the admission.

After admission for scheduled surgery, bloodwork 12 hours before the procedure detected anaemia (Hg 9.0g/dL) with increased levels of Bilirubin, LDH, and decreased Haptoglobin. Discussion with Haematology showed that the patient was incompatible with any Red Blood Cell Concentrate (RBC) due to acute haemolysis.

The surgery team was contacted and the procedure rescheduled. Prednisolone 40mg/d was prescribed, later reduced to 20mg/d. After six weeks, new preoperative bloodwork showed mild anaemia (Hg 11.4g/dL). Prednisolone 20mg/d was maintained. 2 matched RBC Units and 2 units of Pooled Platelets were reserved. General anaesthesia was induced with Propofol 2mg/kg, Fentanyl 1.3µg/kg and Rocuronium 0.8mg/kg.

The maintenance agent was Sevoflurane, with Remifentanil and Dexmedetomidine perfusions. Analgesia included Ketamine 0.26mg/kg, Paracetamol 18mg/kg and Tramadol 1.75mg/kg. Dexamethasone 8mg and Ondansetron 4mg were used as anti-emesis. Surgery ended in 3h55min without incidents and estimated blood loss was 150cc. Post-operative Hg was 9.7g/dL, without increased bilirubin nor LDH. The PACU stay was uneventful and the patient was discharged after 4 days.

Discussion: Acute haemolysis and thrombocytopenia substantially increase perioperative risk. Preoperative measures can reduce this risk, though adverse events may be further complicated by unavailability of matched blood products. Intraoperative stability is paramount to best minimize events and consequences.

Learning points: Evans Syndrome management requires effective multidisciplinary communication between the anaesthesiologist, the surgical team, haematology and internal medicine to provide adequate perioperative care and planning for acute events.

43AP07-1

The relation between hemorrhage and hemodynamic instability on the incidence of postoperative delirium in elderly patients undergoing urological procedures

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Background and Goal of Study: Postoperative delirium (POD) is a common complication in the elderly in urology: **The purpose of this study** is to find out if there is a relationship between hemorrhage, hypotension and bradycardia in the incidence of postoperative delirium in the elderly in urology.

Materials and Methods: A total of 648 patients were included in the study, aged over 65, men. All underwent prostate surgery, TURP or open prostatectomy.

The patients were evaluated for intraoperative hemorrhage, as well as bradycardia hypotension and their respective treatment with blood, ephedrine, atropine. The patients who developed POD were compared with those who did not: The comparison consisted in presence of hemorrhage, hypotension, bradycardia, and the need for hemotransfusion.

While the preoperative factors were the same based on ASSA . Statistically significan.P-value (python) (p<0.05)

Results and Discussion: Out of 648 patients, 99 patients experienced POD, which means 15% of the patients in total. There were 36 patients with hemorrhage that required hemotransfusion, 18 of them (50%) experienced postoperative delirium (they were over 71 years old). Hypotension and bradycardia accounted for 216 of which 36 had hemorrhage, and of these 180 who had hypotension without hemorrhage, postoperative delirium accounted for 54 (25%) of the patients. These 54 patients were the patients whose hypotension lasted longer and required to consume higher doses of ephedrine and atropine. While among the patients without hemorrhage and hemodynamically stable (432 patients) delirium was encountered in 27 (6.25%) patients.

Conclusion(s): We noticed that hemorrhage was significantly associated with postoperative delirium, and especially if it was combined with advanced age. The p-value is significantly less than 0.0001, indicating a highly statistically significant relationship between hemorrhage and postoperative delirium. (Delirium in these patients occurred in 50%).

Also, we noticed that lasting hemodynamic instability with long use of ephedrine and atropine was an important component for postoperative delirium. P-value ≈3.1×10−13This extremely small p-value (much less than 0.0001) indicates a highly statistically significant relationship between hypotension, bradycardia that received ephedrine atropine and postoperative delirium. (Delirium in these patients was found in 25%). Meanwhile, in patients without hemorrhage and with hemodynamic stability, it occured in 6.25%

Clinical evaluation of cell salvage in paediatric surgery: Outcome data from our clinic

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Background and Goal of Study: Cell salvage is an essential component of Patient Blood Management in paediatric surgery, where limited blood volume and transfusion risks pose significant challenges. This study evaluates the use of the CATSmart® CellSaver system, focusing on its impact on blood loss and transfusion reduction.

Materials and Methods: This prospective, observational study was conducted with local Ethics Committee approval and a waiver for informed consent. We analysed data from patients undergoing surgeries (scoliosis, major abdominal, and lower limb orthopaedic) with expected high blood loss, where the CATSmart® system was used. Collected data included patient demographics (age, weight, height, and gender), surgical classification (acute or elective), haematocrit, blood loss, salvaged blood volume, reinfused packed red cells, and the type of wash protocol (Low or Smart Volume Wash). The data were analysed descriptively using mean and median values for absolute and relative blood loss, calculated according to patient weight.

Results and Discussion: During the study period, data from 11 paediatric surgical procedures utilising the CATSmart® CellSaver system were analysed. The mean absolute blood loss was 550.27 ml (range: 100-1570 ml), with a median of 352 ml. For patients ≤ 20 kg, the mean was 142.5 ml (median: 135 ml), and for patients > 20 kg, 697.57 ml (median: 500 ml). The mean relative blood loss was 13.3% (range: 4.93%–26.47%), with a median of 14.29%. For patients ≤ 20 kg, the mean relative blood loss was 13.59% (median: 11.84%), and for those > 20 kg, 13.14% (median: 14.3%). These findings suggest that the CATSmart® system effectively manages blood loss in paediatric patients, particularly in those with higher body weight (> 20 kg) or significant blood loss (> 500 ml). In smaller patients (≤ 20 kg), the system's impact was less pronounced due to lower blood loss volumes and limited reinfusion requirements.

Conclusion(s): Cell salvage systems are an important part of paediatric patient blood management, especially in surgeries with higher estimated blood loss and in children above 20 kg of weight. Further studies with larger cohorts are needed to confirm these

Acknowledgements: This research was supported by Specific University Research provided by MŠMT (MUNI/A/1771/2024, MUNI/A/1733/2024), and supported by MH CZ - DRO (FNBr, 65269705).

43AP07-3

Intraoperative stroke during retroperitoneal surgery: case report

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Background: The incidence of perioperative stroke following noncardiac, nonneurologic surgery is 0,1-0,8%. Perioperative strokes are more common in certain populations and specific surgical procedures, posing a significant risk for postoperative morbidity and mortality. Prompt identification and treatment of perioperative stroke can improve neurological outcomes. We present a case of a patient who suffered an intraoperative stroke.

Case Report: A 73-year-old male, ASA III, with a history of atrial fibrillation, hypertension, and overweight status, previously underwent surgery for perivesical hemangiopericytoma. Anticoagulation was discontinued due to recurrent bleeding episodes. He was scheduled for resection of a large retroperitoneal pelvic mass and underwent combined anesthesia. Massive intraoperative bleeding led to hemodynamic instability and activation of the massive hemorrhage protocol. Postoperatively, the patient presented with confusion, expressive aphasia, central right facial palsy and right hemiparesis. A stroke protocol was immediately activated, and a computed tomography (CT) confirmed an acute ischemic stroke with a thrombus in the middle segment of the left M1. The patient underwent thrombectomy and was anticoagulated with enoxaparin. He remained hospitalized for 14 days and was discharged hemodynamically stable, with mild motor deficits in the right upper limb and anticoagulation with edoxaban.

Discussion: Several cardiovascular risk stratification tools are valuable in predicting perioperative complications. According to the CHA₂DS₂-VASc score, this patient had an estimated stroke risk of 2.9%. However, this risk was underestimated, as the patient was not on anticoagulation therapy and experienced an intraoperative period of hypotension due to massive bleeding. Identifying stroke symptoms in the perioperative period is challenging because factors like prolonged intubation and residual effects of anesthesia can mask clinical signs. Rapid response protocols should be activated promptly when stroke is suspected, enabling immediate neurological assessment, imaging, and therapeutic intervention.

Reference:

Circulation, Volume 143, Issue 19, May 11, 2021; Pages e923-e946 Learning points: An early activation of the stroke protocol contributed to a favorable outcome. Continuous education of healthcare providers on recognizing stroke signs and the importance of immediate action is crucial to improving patient outcomes.

Acquired FXIII deficiency in patients witg ECMO: case reports

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Background: Coagulopathy induced by ECMO, exacerbated by patient-specific characteristics, may lead to persistent bleeding despite normal coagulation tests. Acquired factor XIII (FXIII) deficiency, though rare, is an important cause.

We present four cases of acquired FXIII deficiency in patients receiving ECMO, all of whom experienced severe haemorrhagic complications and coagulation tests.

Case Report:

- 1: A 55-year-old male with severe thoracic trauma and acute respiratory distress syndrome (ARDS) required venovenous ECMO. Despite discontinuation of heparin, he experienced persistent haemorrhaging, requiring a total of 12 units of red blood cells. FXIII deficiency was confirmed with a level of 15%. ECMO was discontinued, and 1000 UI FXIII were administered, achieving bleeding control without further transfusions. Follow-up showed a FXIII level of 46%.
- 2: A 21-year-old male with severe trauma, developed ARDS requiring venovenous ECMO. After ECMO removal, thrombosis was noted in the inferior vena cava, and anticoagulation with enoxaparin was initiated. He developed bleeding from the oropharyngeal mucosa and tracheostomy site. Acquired FXIII deficiency was confirmed with a level of 28%. 2 doses of 750 IU FXIII were administered, resulting in bleeding control and a follow-up level of 41%.
- **3**: A 57-year-old male, after cardiac transplantation, required venous-arterial ECMO due to primary graft dysfunction. Following ECMO removal, he developed progressive anaemia with daily transfusion requirements (21 units). FXIII was 18%. After 1500 IU FXIII replacement, bleeding persisted. Follow-up level after one week was 28%.
- **4**: A 52-year-old female with fulminant myocarditis required peripheral venous-arterial ECMO as a bridge to heart transplantation. Postoperatively, she developed significant anaemia, with abundant drainage from chest tubes. FXIII level was 46%. Following reintervention and ECMO removal, no further transfusions were required.

Discussion: Persistent bleeding in ECMO patients may be attributed to acquired factor XIII deficiency, a condition that goes undiagnosed by standard coagulation tests. Early recognition and replacement of factor XIII can effectively control bleeding and reduce transfusion requirements.

Reference:

J Clin MEd 2023;12:4115

Learning points: Factor XIII deficiency should be considered in the differential diagnosis of coagulopathy in ECMO patients, and its measurement included in routine coagulation assessments.

43AP07-6

Impact of red blood cell storage duration on hemoglobin response in elderly patients undergoing non-cardiac surgery

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Background and Goal of Study: Severe anemia resulting from blood loss remains a predominant reason for perioperative red blood cell (RBC) transfusions. Concerns about the clinical impact of RBC storage-induced changes, termed "storage lesions", and their potential harm in elderly patients warrant further investigation (1,2).

This study aimed to assess the effect of RBC storage duration on hemoglobin (Hb) increments in patients aged ≥70 undergoing non-cardiac surgery.

Materials and Methods: 1,626 RBC transfusion events in 505 patients (2018-2022) across two study sites of a still ongoing prospective randomized controlled trial to determine the transfusion threshold of non-cardiac surgery patients above 70 years (LIBERAL). A linear mixed effects model assessed the influence of RBC storage duration and confounders, such as pre-transfusion Hb levels, measurement intervals, and manufacturing variations, on Hb increments. RBC characteristics, such as hemoglobin content and production methods, were incorporated into the analysis. Analysis neither unblinded nor corrupted any data of the larger LIBERAL trial.

Results and Discussion: Analyses revealed no statistically significant effect of RBC storage duration on Hb increments. Significant predictors of Hb response include pre-transfusion Hb levels, measurement intervals, and manufacturer-specific Hb content. Differences in production methods and additive solutions contributed to variations in transfusion outcomes between centers, with no clinical disadvantage noted for longer-stored RBCs.

These findings align with existing studies, such as the ABLE and RECESS trials, indicating no adverse impact of storage duration on transfusion efficacy within standard limits.

Conclusion(s): RBC storage duration does not significantly affect Hb response in elderly perioperative patients. Transfusions with standard-stored RBCs remain effective, supporting their continued use up to standard storage limits. These findings, corroborated by existing studies, (3) emphasize the need for future studies to refine transfusion practices through tailored strategies particularly for elderly patients.

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Assisted fluid management (AFM) as a guide to intraoperative fluid therapy

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Background: Anesthesiology is one of the disciplines that most successfully integrated Al-based technologies. Intraoperative fluid therapy is a critical area, where Al has proven its usefulness. The objective of fluid therapy is to provide fluids to increase the patient's SV and, CO. However, its administration must be careful, since a positive fluid balance due to excessive administration, is associated with increased morbidity and mortality. In the same way, hypovolemia or preload-dependency has risk of hypoperfusion. Therefore, predicting how our patient will respond to volume administration is crucial.

The AFM software includes an AI and machine learning algorithm that integrates patient hemodynamic variables and individually assesses preload-dependency. This algorithm learns from the patient and predicts the response to fluids based on the previous response and the current hemodynamic situation.

Case report: 55-year-old, male, diagnosed with sigmoid cancer, who underwent laparoscopic robotic sigmoidectomy. Advanced hemodynamic monitoring with minimally invasive CO monitoring was used, supported by the HPI and AFM systems. After pneumoperitoneum, the patient presented an increase in Blood pressure (BP) with an increase in SVR requiring analgesia adjustment with remifentanil infusion and occasional urapidil boluses.

Although the patient maintains BP, AFM recommends a fluid bolus. The bolus is accepted and it turns out positive, with an increase in SV > 15% and CI after the administration of 3 fluid boluses.

During the rest of the surgery, we achieved hemodynamic optimization: normal BP (MAP > 70mmHg), SVR and CI (> 3,5 I/min/m2), a SVV < 12%. Surgery lasted 2:50h. 1200ml of crystalloids were administered.

After analyzing the case data using the Acumen Analytics system, we observed that the patient had a total of 0 minutes of hypotension, and the administration of fluids following the AFM algorithm also allowed to optimize CI values after fluid administration.

Discussion: The development of intraoperative hypotension is detrimental to the patient as it is associated with adverse outcomes, such as, acute kidney injury, myocardial injury, and even increased mortality. The chances of an adverse outcome increase with the duration and magnitude of hypotension and even short periods of hypotension appear to be associated with adverse outcomes. These outcomes occur due to hypoperfusion.

Therefore, if our patient has normal BP, does that mean that we are managing the patient's hemodynamics the best as possible and can ensure that hypoperfusion is not occurring?

Although a large number of cohort studies have suggested an association between perioperative hypotension and poor outcomes, RCTs have failed to demonstrate improved outcomes with higher BP maintenance. In the BP formula (CO \times SVR), we observe that combinations of different CO and SVR changes represent different physiological states underlying a BP value.

Thus, with a normal BP value, this may be due to an increase in arterial load, to compensate for a drop in CO; this decrease in flow, together with the increase in SVR, may compromise tissue perfu-

sion and therefore cause organic damage. Avoiding intraoperative hypotension is crucial to reduce its possible adverse effects. Although hypotension does not always cause tissue hypoperfusion, we must also understand that a normotensive patient may not have adequate CO and perfusion, as occurs in certain states of shock.

Therefore, BP is not always a faithful reflection of CO and therefore, optimizing CO and flow are also priorities when it comes to optimizing the patient's hemodynamics, despite normal BP values. Preload-dependence identifies a patient who can improve their CO (flow) with volume administration if they have an adequate vascular tone (arterial elastance).

In these cases, and if the CO target is not met (CI < 2.5), the benefit of fluid therapy is proven. Thus, the increase in CO will lead the arterial system to regulate itself, normalizing SVR values and thus optimizing organic perfusion.

Studies show that the hemodynamic management of patients can be improved with the help of Al. Joosten's study (1) is a prospective randomized controlled study that compares Al-assisted or manual hemodynamic management, and it is shown that individualized Al-assisted management reduces intraoperative hypotension, compared to a manually directed approach, as well as, maintaining the patient in the preload-independence zone. Maheshwari et. al (2), showed the greater effectiveness of AFM software in fluid administration, 66% of the fluid administered by boluses recommended by the software, resulted in the desired increases in VS, compared to the reference rate of 30%, when AFM is not used. (2).

A high percentage of time in the preload-independence zone was not achieved. This was due to a lack of adherence by physicians to AFM indications because the patient presented normal BP values. If a patient is preload-dependent, he will benefit from fluid administration as long as it is beneficial for the patient to increase CO. This is supported by other studies where it has been observed that maintaining blood volume optimized, that is, patients who remain in the preload-independence zone for longer, maintain a cardiac index > 2.5 for a significantly longer time. (3). AFM software combines the identification of the preload-dependence state with the patient's hemodynamic response to fluid administration, discriminating hemodynamic situations in which the patient responds or not.

References:

- 1. Maheshwari K et al, AFM Software Guidance for Intraoperative Fluid Administration.
- 2. Joosten A. et al. Practical impact of a decision support for goal-directed fluid therapy on protocol adherence: a clinical implementation study in patients undergoing major abdominal surgery.
- 3. Meng L. Heterogeneous impact of hypotension on organ perfusion and outcomes. BJA.

Learning points: AFM software is a useful tool that allows for personalized fluid administration, allowing the patient to be kept in the preload-independence zone with less fluid administration.

Analysis of requests for red blood cell reservation in surgical patients at a tertiary care hospital from 2021 to 2023: a cross-sectional observational study

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Background and Goal of Study: Evaluating transfusion patterns across different surgical specialties is essential for establishing rational blood use strategies in healthcare institutions.

This study aims to assess the profile of concentrated red blood cell requests and utilization at a tertiary university hospital in Brazil.

Materials and Methods: This is a retrospective cross-sectional study conducted at the Professor Edgard Santos University Hospital, a tertiary healthcare facility. Data were obtained from surgical and hemotherapy department records for patients undergoing surgical procedures between 2021 and 2023. Three indices were used: crossmatch-to-transfusion ratio (C/T), transfusion probability (TP%), and transfusion index (TI). The following are the ideal values for each index: C/T should be ≤ 2.5, TP% should be ≥ 30%, and TI should be ≥ 0.5.

Results and Discussion: A total of 12,466 surgeries were performed, including 941 urgent procedures. Concentrated red blood cells were reserved for 1,814 patients, with 3,885 units crossmatched. However, only 54 patients received transfusions, utilizing 102 units. When analyzing only surgeries with more than 10 red blood cell requests, major procedures such as oncological neurosurgeries, open cardiac surgeries, and large abdominal surgeries were included. No surgery had a C/T ratio below 2.5, with the closest being cystectomy (C/T = 3.4). Cystectomy was also the only surgery with TP ≥30%. Regarding TI, cystectomy (TI = 0.6) was the only procedure with TI ≥0.5, followed by abdominal-perineal amputations (TI = 0.36) and surgeries for myocardial revascularization and valve replacement (TI = 0.35). Some procedures, such as penile plastic surgery, and vaginal hysterectomy, had C/T ratios close to infinity and no transfusions. The transfusion indices serve to evaluate the red blood cell usage profile, verifying the efficiency of transfusion systems (Stanworth et al, 2002).

Conclusion(s): The study demonstrates that there is an excess of concentrated red blood cell requests that are not utilized in most surgical procedures. Implementing a personalized blood reservation protocol based on these data would lead to more efficient blood usage and reduced unnecessary transfusions.

Reference:

Stanworth SJ, Cockburn HAC, Boralessa H, et al. Which groups of patients are transfused? A study of red cell usage in London and southeast England. Vox Sang. 2002;83:352-7.

43AP07-9

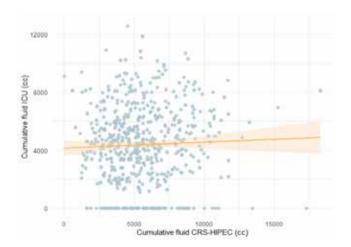
Perioperative fluid management in CRS-HIPEC: associations, and impact on ICU stay and postoperative outcomes

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Background and Goal of Study: Cytoreductive surgery (CRS) with hyperthermic intraperitoneal chemotherapy (HIPEC) improves outcomes for peritoneal metastasis but may cause intra-operative hemodynamic instability. A hyperdynamic state lowers vascular resistance, requiring catecholamines and fluids. Fluid management is challenging due to extensive surgery, HIPEC, blood loss, and ascites. Excess fluids may cause tissue edema and morbidity. This study evaluates fluid use during CRS-HIPEC, its link to complications, and patient characteristics tied to high fluid needs.

Materials and Methods: This single-center retrospective cohort study included all 583 patients who underwent CRS-HIPEC at Antoni van Leeuwenhoek (2007–2023). Fluid administration at T1 (end CRS-HIPEC), T2 (ICU stay - 08:00 day 1), T3 (08:00 day 1 - 08:00 day 2), and T4 (08:00 day 2 - 08:00 day 3) was collected. We explored the correlation between intraoperative fluid volumes and post-operative fluid administration; association between fluid administration and outcome (kidney function, ICU length of stay), when dividing intra-operative fluids in 4 quartiles; and examined independent association of patient characteristics.



Results and Discussion: Median age was 61 years (20–82). Median fluid administration: T1 5239 mL [566–18297], T2 1914 mL [670–4541], T3 3763 mL [1320–9025], and T4 2598 mL [1151–8339]. No correlation was found between intraoperative and ICU fluid volumes (p=0.3704). Patients in quartile Q4 (receiving >6866 mL) had longer ICU-LOS compared to those in Q3 (receiving 5239–6866 mL) (p=0.025).

No association was found between intraoperative fluid and postoperative creatinine changes (p=0.4684, p=0.7017). Fluid administration was not associated with age, NYHA class, BMI, MET score, smoking, ASA score, or mean intraoperative ABP, when adjusted for propofol dose, anesthesia duration, and blood loss (e.g., age p=0.1372, NYHA p=0.1996).

Conclusion(s): High intraoperative fluid volumes are common during CRS-HIPEC and seem linked to longer ICU stay. No correlation exists between intraoperative and postoperative fluid volumes, and no patient characteristics were associated with abovemedian fluid use.

43AP07-10

Coagulation management of a patient with von Willebrand disease undergoing cardiac surgery: Case report

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Background: Von Willebrand disease (VWD) is inherited blood clotting disorder characterized by a deficiency or dysfunction of von Willebrand factor (vWF). This condition increases the risk of severe bleeding, especially during cardiac surgery which often accompanied using cardiopulmonary bypass (CPB) and poses significant risks for such patients.

This report outlines the challenges and solutions implemented to ensure a successful surgical outcome during cardiac surgery with

Case Report: 36-year-old men with history of VWD type 1, ASA 3, was admitted to the hospital for aortic valve replacement due to severe aortic valve insufficiency and ventricular septal defect. Clinical blood test: hemoglobin 13.6 g/dL, platelet count 197g/L, prothrombin time 13.0s, partial thromboplastin time 33.0s, international normalized ratio 1.4. Before CPB 25 mg/kg of tranexamic acid was arranged. Activated clot time (ACT) before heparin was 234s. ACT after heparin (27000 IU) was 856s. Intraoperative mild hypothermia (34.4°C) was maintained during CPB. After the patient was weaned from CPB deliberate hypotension was employed to minimize blood loss. Mean arterial pressure was kept 70 mmHg, heart rate - 80. Coagulopathy treatment was guided by thromboelastography (TEG) that indicated impaired platelet function, a deficiency in clotting factors and unstable clot formation during CPB. Blood component transfusion included: 1 IU of platelets, 4 IU of fresh frozen plasma, 2 IU of cryoprecipitate, 1 IU of red blood cells. A bolus of 1000 IU of inactivated concentrate of clotting factors II, VII, IX, X and 3000 IU of concentrate vWF 1500 IU and factor VIII 3000 IU IV was administered. ACT after protamine (270 mg) was 112s. Subsequent TEG demonstrated effective clot formation and clot stability. The patient was transferred to the ICU with a hemoglobin at 10.2 g/dL. In the first two hours, the fluid output in the Pleur-Evac drain system was 140 mL. The patient no longer required blood components. He continued receiving 3000 IU vWF and factor VIII daily, until the removal of the last catheter. Discussion: Transfusion of vWF and factor VIII is the only proven treatment for VWD. This strategy shows favorable outcomes and is commonly used in practice.

Learning points: We determined that TEG could be helpful in developing a therapeutic plan for patients with coagulation disorders as it provides a qualitative assessment of the coagulation status and improving blood transfusion management.

43AP07-11

Intraoperative cardiopulmonary resuscitation in prone position during massive bleeding: a case report

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Background: Cardiac arrest (CA) in prone position demands measures for cardiopulmonary resuscitation (CPR) which are similar to those performed in supine position. The causes of can be different.

We will present a case report a female patient which is resuscitated in prone position in operating theater.

Case Report: A 45-year-old female patient was admitted to our hospital for neurosurgical removal of intracranial arterio-venous malformation (AVM). She was awake, communicative, without neurological deficit. After induction into general endotracheal anesthesia, the patient was placed into prone position with arms along with the body. She was hemodynamically stable with appropriate oxygenation. 3 peripheral intravenous cannulas were placed as well as arterial line.

From the moment resection of AVM was initiated, the profuse bleeding occurred. Aggressive volume resuscitation was done (crystaloids, packed blood cells, fresh frozen plasma).

Despite our resuscitation measures, the arterial blood pressure has fallen and Noradrenalin infusion was initiated. After a few minutes, the patient was in CA, without arterial pressure, capnography and pulse.

Chest compression with frequency 100-120/min was done along with Epinephrine 20 mg intravenously and the blood products resuscitation. At the moment when the surgeon got the control of the bleeding, and about 30 minutes after compressions, the pulse occurs.

After surgery, the patient was transferred to intensive care unit, unconscious, hemodinamically unstable, with dilated and slowly reacted pupils.

Discussion: CPR is performed in patients who are at the moment of CA in prone position. The outcome depends on cause of the cardiac arrest. In our case, the cause was uncontrolled bleeding from intracranial arteriovenous malformation. CPR was necessary for patient's outcome, till the moment of appropriate blood substitution was done.

References:

- 1. Anez C, Becerra-Bolanos A, Vives-Lopez A, Rodriguez-Perez A. Cardiopulmonary resuscitation in the prone position in the operating room or in the intensive care unit: a systematic review. Anesth Analg. 2021;132(2):285-292.
- 2. Semanco M, Hansen D. Prone cardiopulmonary resuscitation: an intensive care unit case series. Journal of Emergency and Critical Care Medicine 2022;6:27. doi: 10.21037/jeccm-22-26 **Learning points:** Early initiation of CPR as well as appropriate administration of blood derivates is necessary for good outcome of CPR in bleeding patient.

Devices and Technology

50AP01-1

Preliminary study of the comparison of **Contrafluran and Anesthetic Gas Scavenging** System (AGSS) in capturing waste anaesthetic gases in the real-world operating theatre environment

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Background and Goal of Study: Chronic exposure to waste anesthetic gases (WAG) is a significant occupational health risk for operating theatre (OT) staff. However, limited evidence links WAG exposure levels to specific surgical procedures. This study evaluates ambient WAG levels during robotic and open abdominal surgeries, assessing compliance with National Institute for Occupational Safety and Health (NIOSH) limits and exploring procedural differences. A parallel non-crossover design was used, with an Active Anesthetic Gas Scavenging System (AGSS) applied for 30 days, followed by a passive mode with the Contrafluran volatile capture device in the same OT. This abstract focuses on AGSS phase findings.

Materials and Methods: Ambient desflurane and sevoflurane concentrations were measured during 27 surgeries (21 robotic, 6 open) at Singapore General Hospital using the GT5000 gas analyzer (Gasmet Technologies, Terra, Finland). Sampling sites included distal to the Contrafluran canister/anesthesia machine, 5 cm from the patient's nose/mouth, and 1 meter from the anesthesia workstation. Gas samples were collected every 10 minutes, with key time points including baseline, after connection to the breathing circuit, extubation, and patient departure. Differences in WAG levels between robotic and open surgeries were analyzed using the Mann-Whitney U test.

Results and Discussion: Robotic surgeries exhibited higher time-weighted average exposures to desflurane (0.05 ppm vs 0.04 ppm, P< 0.001) and sevoflurane (0.15 ppm vs 0.06 ppm, P < 0.001). Both values were well below the NIOSH limit of 2 ppm. Higher WAG exposure during robotic surgeries may result from factors such as endotracheal tube leaks under high intra-abdominal pressure and head-down positioning. Despite statistically significant differences, the clinical significance is negligible given compliance with NIOSH limits. The small sample size limits the study's generalizability.

Conclusion(s): Although robotic surgeries showed higher WAG exposure levels, these differences are not clinically significant. The long-term risks of exposure remain unclear. These findings support the potential for increased adoption of TIVA in robotic procedures and emphasize customizing exposure management strategies based on surgical factors.

50AP01-3

Evaluation of accuracy of capnography sampling lines: a bench study of procedural bite blocks and EtCO₂ masks

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Background and Goal of Study: Accurate end-tidal CO₂ (EtCO₂) monitoring relies on dependable sampling lines for consistent and reliable measurements. In this study, a series of bench tests were conducted to evaluate EtCO2 accuracy of commercially available sampling lines (Microstream™ and third-party) claiming compatibility with Microstream™ enabled capnography monitoring systems across diverse respiratory scenarios.

Materials and Methods: A series of bench tests were performed on a selection of commercially available sampling lines (procedural bite blocks and EtCO2 masks) to assess EtCO2 accuracy when used in tandem with a Microstream™ enabled capnography monitoring system (Medtronic, Minneapolis, MN). A 3D printed oral-nasal model connected to a lung simulator was set to two different breathing modes to simulate "normal" and "shallow" breathing. Under both breathing modes, oral-only and nasal-only breathing conditions with supplemental oxygen levels of 0, 5, and 10 lpm were tested for the procedural bite block. For EtCO₂ masks, accuracy was assessed for both breathing modes (normal and shallow) during oral-only and nasal-only breathing conditions with supplemental oxygen levels of 0, 4, and 15 lpm. For each testing procedure, three separate sampling lines from the same manufacturer were assessed for five repetitions.

Results: See table showing the accuracy of end-tidal carbon dioxide by sampling line and breathing condition.

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Discussion: Both procedural bite blocks and EtCO2 masks from the Microstream family demonstrated lower EtCO2 error estimates across all tested conditions compared with similar sampling lines from other manufacturers.

Conclusion: These findings highlight potential risks when using sampling lines from outside the Microstream[™] family in tandem with a Microstream™ enabled capnography monitoring system, which may compromise EtCO₂ accuracy in clinical applications.

Acknowledgements: The study was sponsored and funded by Medtronic.

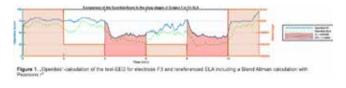
In-Ear-EEG in anesthesiology - a comparison with the standard frontal montage

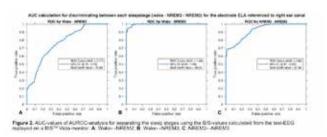
D. Fröhnel¹, S. Schwerin¹, G. Schneider¹, M. Kreuzer¹ ¹TUM University Hospital, Klinikum rechts der Isar, TU Munich, Deptartment of Anesthesiology and Intensive Care, Munich, Germany

Background and Goal of Study: EEG-based patient monitoring is a common practice during anesthesia. For numerous surgical interventions, the standard forehead placement is unsuitable. Tested alternative placements remain "off-label" but in-ear-EEG monitoring could be a promising alternative. Due to parametric similarities, polysomnography EEG records may help validate parameters for neuroanesthesia monitoring.

Materials and Methods: We used data from OpenNeuro (dataset ds004348), including sleep-scored polysomnography EEGs from nine healthy patients. We re-referenced the in-ear channels to the opposite ear canal. A 12-minute test-EEG (containing Wake, NREM2 and NREM3) was created for each patient and replayed to a BIS(TM) Vista monitor. BIS and spectral edge frequency (SEF) values were extracted for the frontal and in-ear channels. Additionally, the "openibis" index was calculated. Area under the receiver operating characteristic (AUROC) values were calculated for separating W, N2 and N3.

Results and Discussion: A Bland-Altman analysis comparing the frontal electrodes with re-referenced in-ear-electrodes showed a Pearson's r² ranging from 0.80 to 0.96 for openibis values (Fig. 1) and from 0.64 to 0.89 for the BIS replay. BIS scores of the test-EEG showed a near-perfect discriminatory ability between W and N3 (AUC = 1.00 [95% CI: 0.99, 1.00]) (Fig. 2B). Discrimination between N2 and W or N3 also yielded acceptable results throughout (AUC ≥ 0.75) (Fig. 2A/C).





Conclusion(s): The calculated openibis values, also the re-referenced ones, correlated well with sleep stages and can be used to discriminate between W and N3, with lesser performance between N2 and W or N3. The replay to a BIS monitor showed strong discriminatory power for the BIS index and even better results for SEF. In-ear EEG may offer a viable alternative to frontal montages for anesthesia neuromonitoring.

50AP01-5

Antibacterial efficacy of nanofiber antibiotics coated central venous catheter: simulation-based pilot study

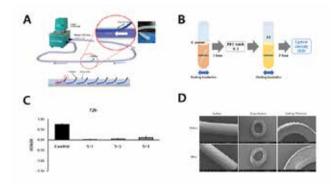
J.E. Cho1, H. Seong1, J.J. Park2, S.Z. Yoon1 ¹Anam Hospital, Korea University College of Medicine, Department of Anesthesiology and Pain Medicine, Seoul, Korea, Republic of, ²CHA Bundang Medical Center, CHA University School of Medicine, Department of Anesthesiology and Pain Medicine, Seongnam, Korea, Republic of

Background and Goal of Study: Central venous catheters (CVCs) are essential in managing critically ill or hemodynamically unstable patients but pose a risk of catheter-related bloodstream infections (CRBIs). To reduce bacterial adherence, the most commonly used CVC is coated with Chlorhexidine and Silver Sulfadiazine (CSS-CVCs) with broad-spectrum antibacterial effects and cost-effectiveness. However, CSS-CVCs may lose antibacterial effects due to shear stress from blood flow, with prior studies showing complete loss of antibacterial activity within 48 hours. Therefore, in this study, we collaborated with the Department of Chemistry at Korea University to develop a new antibiotic nanofiber-coated CVC designed to maintain antibacterial effects for a longer duration. Our goal was to evaluate whether the newly developed CVC could sustain its antibacterial effect longer than conventional CVCs.

Materials and Methods: Eight standard CVCs (ARROW, Arrow International, Inc., USA) served as controls, alongside three types of antibiotic nanofiber-coated CVCs (8 of each type coated with different ampicillin dose, S-1, 6wt%; S-2, 3wt%; S-3, 1wt%). These were exposed to a blood flow rate of 4 L/min for 0, 24, and 72 hours (Figure A). Antibacterial efficacy was assessed by measuring optical density (OD) 600 after Staphylococcus aureus culture (Figure B). Coating wear was analyzed via Scanning electron microscope (SEM).

Results and Discussion: After 72 hours of exposure, the OD 600 measurements demonstrated superior antibacterial efficacy for all three nanofiber-coated CVC types compared to controls (Figure C). SEM analysis showed approximately 50% retention of the coating thickness (Figure D).

Conclusion(s): Antibiotic nanofiber-coated CVCs maintained antibacterial activity for 72 hours, whereas CSS-CVCs lost efficacy after 48 hours. These findings suggest that nanofiber-coated CVCs may be a more effective option for reducing CRBIs when central venous catheters are required for over 48 hours.



Racial and gender disparities in Al-generated image representation of hospital leadership in the United States

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Background and Goal of Study: Artificial intelligence (AI) is designed to enhance human actions and supporting decision-making, has become an integral part of modern healthcare systems. However, its inherent algorithmic biases related to gender, race, and age raise concerns about systemic inequities. Despite the near-equal number of male and female students in medical education, the over-representation of white males in Al-generated outputs underscores the urgent need for ethical practices that promote diversity, equity, and inclusion in Al development and healthcare leadership. This study aims to evaluate demographic representation in images of hospital leaders generated by Al models

Materials and Methods: This cross-sectional study analyzed Algenerated images from Midjourney 6.0, ChatGPT 4.0, and Gemini 3 between October and November 2024 to evaluate demographic diversity in U.S. hospitals across four key leadership categories within the C-suite: Chief Executive Officer, Chief Medical Officer, Chief Nursing Officer, and Chief Financial Officer. The focus was on gender, age, and race/ethnicity to reflect the scope and complexity of these roles. Two independent reviewers classified the images using a simplified version of the Chicago Face Dataset, ensuring consistency and minimizing bias. Statistical analyses were conducted using Stata 17.0 (StataCorp LLC, College Sta-

Results and Discussion: A total of 1,200 images were analyzed, revealing distinct patterns in the representation of four key leadership categories within the C-Suite across various Al models. In ChatGPT, 94.5% of individuals were portrayed as 'white' and 86.5% as 'male.' In Midjourney, these proportions were 75% and 69.5%, respectively, while in Gemini, they were 51.5% and 50.3%. Age representation also showed significant variation, with younger individuals notably underrepresented. Discrepancies in ethnicity classification were observed in 176 cases (14.7%; kappa 0.670), with the highest proportion occurring in Midjourney-generated images (91/400, 22.8%; P<0.001).

Conclusion(s): This study highlights the underrepresentation of women and diverse groups in healthcare leadership, mirrored in Al-generated content, emphasizing the need for systemic reforms in hiring, leadership evaluations, and Al datasets to promote equity, dismantle biases, and reflect workforce diversity and expertise.

Reference: doi:10.1016/j.bja.2024.05.027

50AP01-7 **HOLOSIM:** the way forward in complex crisis training

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Background and Goal of Study: The current state-of-the-art in medical simulation is mannequin-based and utilizes highly specialized and costly personnel, equipment, and centers. We have created a new mixed reality (MR) platform, HoloSIM, which consists of laptop-based instructor software and Microsoft Hololens headset-based student software. The Microsoft Hololens allows spatially stable, interactable, and animated holograms to be inserted into a user's workspace (MR). Though infrequent, anaphylaxis is a high-risk crisis that requires rapid decisive action. which presents a challenge for trainees. HoloSIM simulation will be non-inferior in knowledge acquisition and application of decision-making concepts in anaphylaxis management compared to high-fidelity mannequin-based simulation.

Materials and Methods: This study is a REB-approved prospective randomized control trial where 40 junior medical students were randomized to either a Hololens-based or a mannequin-based simulation regarding anaphylaxis management (NCT04591041). Both groups completed a pre-test and practiced anaphylaxis management using their assigned modality. We invited the participants to return one week later to complete a posttest and knowledge application test on a new mannequin-based crisis assessment scenario.

Results and Discussion: For the knowledge application test, the HoloSIM group had an average score of 25.7+/-5.5, and the mannequin group had an average score of 26.7+/-6.1 (P=0.59). We were unable to demonstrate non-inferiority. Conversely, there were no statistically significant differences either. The system usability score (SUS) for the HoloSIM platform was 59.9, which is considered below average (SUS Average = 68) and in the 'marginally acceptable' category. Despite the usability scores, when asked if 'this type of simulation was beneficial to my learning' and if they 'would participate in this type of simulation session in the future', 89% and 95% of participants in the HoloSIM group agreed or strongly agreed with the statements.

Conclusion(s): MR is still a new innovation in medical education. This study is among the first to create MR critical care simulations using comprehensive learning theories. Given the HoloSIM platform is still a prototype platform, the low SUS could have interfered with the desired learning outcomes. However, given the medical students' enthusiasm, we believe these issues can be improved with further development and studies.

pyAKI - an open source solution to automated acute kidney injury classification in large datasets

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Background and Goal of Study: Acute Kidney Injury (AKI) is a frequent and often severe complication in critically ill patients, affecting up to 50% of ICU admissions. Standardized AKI classification using the Kidney Disease Improving Global Outcomes (KDIGO) criteria is essential, but challenging in large datasets due to the lack of accessible and consistent tools. This project introduces pyAKI, an open-source tool designed to automate AKI classification by implementing the KDIGO 2012 definitionin time series data, addressing this gap to improve reproducibility and quality in AKI research.

Materials and Methods: PyAKI was developed and validated using the Medical Information Mart for Intensive Care (MIMIC-IV) database. The pipeline applies KDIGO 2012 guidelines for AKI classification based on serum creatinine (SCr) and urine output (UO). A standardized data model was constructed, and interpolation techniques were used to process sparse data. Validation involved comparing pyAKI's output with expert annotations by a panel of junior and senior physicians.

Results and Discussion: Validation results demonstrate that pyAKI achieved an accuracy of 1.0 in all KDIGO stages, surpassing the performance of human annotations, which had a sensitivity of 0.96 and specificity of 0.99. The pipeline was highly efficient, labeling the dataset in 0.27 seconds compared to 970 minutes required by physicians. PyAKI's consistent high accuracy and efficiency make it a valuable tool for AKI classification in large-scale datasets, reducing the variability inherent in human annotation and enabling more reproducible research.

Conclusion(s): PyAKI offers a reliable, open-source solution for AKI classification using KDIGO 2012 AKI criteria. PyAKI exceeds human-level accuracy. Its availability enhances the consistency and scalability of AKI research, providing a powerful tool for clinical research and decision support in critical care that can spare time for AKI classification for research projects.

50AP01-9 When robotics leave the operating room

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Background: Robotic systems for interventional radiology (IR) are in early stages of implementation. They promise advantages, such as precise navigation and guidance, reducing radiation exposure and providing better access to challenging areas.1

However, the anesthetic management is rarely mentioned. In this report we detail the anesthetic management of a patient undergoing robot-assisted hepatic thermoablation (RAHTA) and its challenges.

Case Report: An 89 yo, American Society of Anesthesia (ASA) III patient, was proposed for RAHTA guided by computed axial tomography (CT). The patient was positioned in supine, arms adducted, inside the CT machine. ASA standard, depth of anesthesia and neuromuscular blockade monitoring was used. Total intravenous anesthesia was performed.

Fentanyl was administered prior to intubation and thermoablation. The patient was intubated. Short periods of apnea were used during CT-scan and robotic navigation.

To prevent desaturation, the patient was ventilated with 80% FiO_a immediately prior and after apnea. Multimodal analgesia was used for adequate analgesia. Ondansetron was administered to avoid nausea and vomit. Neuromuscular blockade was reversed and the patient was extubated. The patient was admitted to the recovery ward. There were no adverse events and patient was stable throughout.

Discussion: Scientific and technological developments impose an anesthetic challenge outside the operating room. Patient positioning changes according to lesion location and the patient should be positioned comfortably and the optical camera unimpeded. Apnea or high frequency jet ventilation ensure minimal impact on imaging and robot navigation.2

Any movement after imaging can alter the robot's planned path, with severe consequences. To ensure immobility, neuromuscular blockade should be applied. If periods of apnea are performed, the patient should be adequately oxygenated. Pain can be severe and prolonged, often requiring opioids to treat visceral pain.2 Nausea and vomiting due to opioid use and visceral inflammation should be treated. Throughout medical advancements, the quality and safety of patients' procedures must always be guaranteed.

References:

- 1. Br J Radiol. 2023 Dec;96(1152):20230620.
- 2. Local Reg Anesth. 2019 Dec 4;12:127-137.

Learning points:

- · Minimizing movement is mandatory for optimal targeting and safety during RAHTA.
- General anethesia with neuromuscular blockade appears to be the optimal anesthetic plan.

Non-invasive vs biological blood hemoglobinemia determination for perioperative management: systematic review and meta-analysis

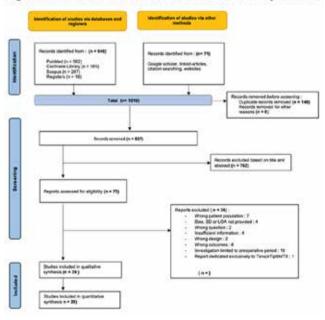
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Background and Goal of Study: Hemoglobin is an essential parameter for quantifying anemia and used for guiding transfusion. Conventional methods require intermittent invasive sampling (time to obtain). Hemoglobinemia by pulsed co-oximetry is noninvasive, immediate and offers the advantage of continuous monitoring. The aim of this systematic review is to assess the diagnostic accuracy of pulsed co-oximetry compared with biological determinations in perioperative management.

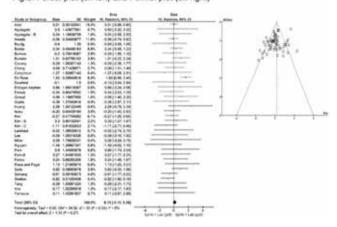
Materials and Methods: The review was performed according to the PRISMA statement (Fig.1). Searches in Pubmed, Cochrane Library and Scopus databases were performed from January 2000 to February 2024 for studies comparing non-invasive haemoglobin measurement with invasive methods. The QUADAS-2 scale was used to assess the risk of bias. For data analysis, Review Manager 5.4.1 software was employed, using the inverse variance method and a random-effects model to calculate the mean difference (MD) and 95% confidence intervals. Sensitivity of analysis were performed to determine the influence of several variables on the results

Fig.1. Prisma flowchart of the literature search and study selection



Results and Discussion: The meta-analysis included 36 studies involving 1888 patients (Fig.2). Meta-analysis revealed a mean difference between the non-invasive and invasive methods of 0.13 g.dL-1 (95% confidence interval [CI]: 0.10- 0.36) (P-value > 0.05). Sensitivity analyses showed no statistically significant difference between the two methods. There was a very good homogeneity among the studies (I2=0%). Trending analysis was considered acceptable in a majority of the studies (Fig.2)

Fig.2. Forest plot (on left) and Fennel plot (on right)



Conclusion(s): The results obtained support the reliability of pulsed co-oximetry. Considering the potential benefits of this parameter, it seems rational to integrate this technology perioperatively to guide standard clinical practices for optimizing the management of surgical patients.

50AP01-11

Analgesia Nociception Index (ANI) for guiding intraoperative opioid administration during living donor liver resection and its impact on postoperative nausea and vomiting

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Background and Goal of Study: Anaesthesiologists often rely on changes in the autonomic nervous system, such as heart rate, blood pressure, and sweating, to help determine the need for pain relief medication. The analgesia nociception index (ANI) is a noninvasive tool used for monitoring the intraoperative state of the autonomic nervous system, particularly the parasympathetic nervous system. During long-lasting high nociceptive surgery, fentanyl was infused at our institution. Opioids can lead to postoperative nausea, vomiting, and other complications when an overdose occurs. The fentanyl dosage changes significantly after hours of infusion due to context-sensitive halftimes.

This study aimed to assess whether intraoperative analgesia nociception monitoring (ANI) could affect the average intraoperative dose of fentanyl and, subsequently, the occurrence of postoperative nausea and vomiting.

Materials and Methods: Patients who were included in this study underwent living liver donor resections with fentanyl infusion and thoracic epidural analgesia. Two groups of patients were analyzed: the ANI group (n = 24), in which the fentanyl dose was adjusted with ANI monitoring, and the retrospective control group (n = 25), with standard practice.

Results and Discussion: A t test, Wilcoxon test, a chi-square test were conducted to assess the difference between the ANI and control groups. Statistical significance: p<0.05. We found a 36.63% decrease in the average dose of fentanyl in the ANI group (1.28 (±0.48) µg·kg⁻¹·hour⁻¹) compared with that in the control group (2.02 (± 0.46) ug·kg⁻¹·hour⁻¹) (p < 0.001).

Additionally, there was a 24.25% reduction of PONV in ANI group but without the statistic significance (p = 0.636). The negative results may be due to the greater number of females in the control group and the use of sevoflurane.

	ANI (n=24)	Control (n=25)	p value	
ANI mean value	62.59 (±8.69)			
Time of anaesthesia (min)	565 (540–600 [320-730])	510 (450–600 [360-930])	0.1546	
Fentanyl (µg·kg ⁻¹ ·hour ⁻¹)	1.28 (±0.48)	2.02 (±0.46)	1.613e-06 (<0.001)	
PONV	8 (33.33%)	11 (44%)	0.636	

Conclusion(s): We suggest that ANI monitoring can be used for guiding fentanyl infusion, reducing opioid consumption in comparison with standard practice.

Further randomized trials with other modalities, such as ASA III-IV patients, total intravenous anaesthesia with opioids with stable context-sensitive halftime and surgery with low nociceptive stimuli, are needed.

50AP02-1

Comparative study of the concordance between BIS® and CONOX® registers for monitoring cerebral hypnosis in general anesthesia

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Background and Goal of Study: We have multiple devices for monitoring cerebral hypnosis during general anesthesia. The analysis of the electroencephalographic trace allows us to adjust the doses of anesthetic drugs, reducing their side effects, shortening the duration of anesthetic emergence, and minimizing the incidence of intraoperative awakening.

The aim of the study was to correlate the values obtained using the BIS® monitor and the gCON index of the CONOX® monitor to determine their agreement and interchangeability in the monitoring of cerebral hypnosis during general anesthesia.

Materials and Methods: 31 patients scheduled for otorhinolaryngological surgery under general anesthesia and orotracheal intubation were recruited, following a pre-established anesthetic protocol. Based on the BIS® index and the CONOX® qCON index data, as well as their respective signal quality index (SQI) and electromyogram (EMG) values, collected randomly every 5 minutes by the principal investigator, two types of recordings were established: those independent of SQI and EMG, and those considered "optimal" with SQI ≥90 and EMG ≤30.

Results and Discussion: A total of 941 pairs of measurements were obtained over 4705 minutes, of which 75.24% were considered "optimal." The recordings showed a high overall agreement (ICC 77.3%, 95% CI; p<0.001). For the "optimal" measurements, high agreement was also found (ICC 78.4%, 95% CI; p<0.001). 95.4% of the values were within the acceptable range of ± 2 SD, while 97.3% were within the range of ± 10 U. Considering only the "optimal" measurements, these values were 95.7% and 97.7%, respectively. The difference between the two sensors was 0.6 units for both total and "optimal" measurements, in favor of the BIS®

Conclusion: The variability obtained between BIS® and CONOX® recordings for monitoring cerebral hypnosis during general anesthesia is acceptable for routine clinical practice, with no expected changes in anesthetic management based on differences in the recordings. Therefore, both are interchangeable without compromising patient safety.

50AP02-2

Bilateral bispectral index and asymmetries in patients with high risk of postoperative delirium: second preliminary report of an observational, prospective, exploratory study

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Background and Goal of Study: Postoperative delirium (PD) and postoperative cognitive dysfunction (POCD) are significant complications after general anesthesia (GA). Bispectral Index (BIS) is a non-invasive monitor to access electroencephalographic information during GA and their asymmetry in right and left cerebral hemispheres (ASYM). BIS values correlates with depth of GA. This study has the aim to evaluate ASYM in a cohort of surgical patients with high risk of PD.

Materials and Methods: Thirty-four patients undergoing head & neck surgery, having 3 of the following criteria ("a priori" high risk), were enrolled: Age>70, male sex, ASA III, status of smoker, arterial hypertension. In theatre, a bilateral BIS probe was applied on their forehead. BIS Vista® monitor recorded left and right total power (0-30 Hz) and ASYM at these timepoints: (t1) BIS probe application (t2) 60" before GA administration (t3) 60" after myoresolution (t4) intubation (t5) surgical incision (t6) end of ipnosis (t7) 10 minutes after extubation. Daily follow-up was performed with CAM scale over 5 post-op days for PD diagnosis and a telephone follow-up with CIT-6 scale at 30 and 90 days for POCD.

Results and Discussion: ASYM of 50% indicates the same inter-hemispheric power; while ASYM<50% indicates a lower power in the left cerebral hemisphere. In our study, patients developing PD had higher power in the right hemisphere at t1, t2, t3 (ASYM<50%), while presented higher power in the left hemisphere at t6, t7 (ASYM>50%). Similarly, patients who developed POCD at 30 days presented prevalence in the right hemisphere at t1, t2 and prevalence in the left hemisphere at t6.

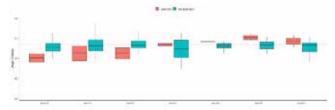


Fig.1 ASYM at different timepoints in patient developing PD at 5 post-op days.



Fig.2 ASYM at different timepoints in patients developing POCD at 30 post-op days.

Variable	N	Delirium, N = 21	Not-Delirirum, N = 291	p-value ²
asym_1	31	48.01 (47.37, 48.64)	49.65 (49.03, 50.21)	0.2
asym_2	31	48.71 (47.61, 49.81)	49.84 (49.07, 50.75)	0.7
asym_3	30	48.71 (47.88, 49.53)	49.86 (49.49, 50.62)	0.5
asym_4	31	50.01 (49.85, 50.18)	49.36 (48.07, 50.70)	0.6
asym_5	31	50.44 (50.42, 50.46)	49.84 (49.53, 50.21)	0.13
asym_6	31	51.07 (50.75, 51.39)	49.94 (49.40, 50.38)	0.11
asym_7	31	50.55 (50.12, 50.98)	49.89 (48.97, 50.28)	0.4

1Median (IQR)

²Wilcoxon rank sum exact test

Variable	N	DCPO, N = 81	Not-DCPO, N = 231	p-value ²
asym_1	31	48.90 (48.72, 49.31)	49.65 (49.21, 50.28)	0.074
asym_2	31	49.16 (48.14, 49.72)	50.08 (49.11, 50.83)	0.12
asym_3	30	49.99 (49.28, 50.73)	49.86 (49.52, 50.45)	0.9
asym_4	31	49.47 (48.11, 50.26)	49.44 (48.16, 50.67)	0.9
asym_5	31	49.96 (49.58, 50.49)	49.90 (49.57, 50.20)	0.5
asym_6	31	50.40 (50.18, 50.62)	49.78 (49.23, 50.29)	0.034
asym_7	31	49.88 (49.20, 50.02)	50.00 (49.00, 50.72)	0.4

¹Median (IQR)

Table 1. Asym values in patient developing PD and POCD.

Conclusion(s): Despite our result are preliminary, they highlight the association between intraoperative inter-hemispheric EEG differences and onset of PD and POCD. BIS monitor appear a promising tool to predict neurological complications after GA.

50AP02-3

Monitoring anesthetic depth and nociceptive response using the CONOX monitor in thoracic surgery: an observational study

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Background and Goal of Study: Thoracic surgery poses significant challenges due to intense nociceptive stimuli, requiring precise intraoperative pain management. Effective control enhances patient comfort, reduces surgical stress, and improves recovery. Regional analgesia, such as paravertebral block (PVB) and thoracic epidural analgesia (TEA), provides effective, localized pain relief with fewer systemic side effects. Variability in patient response highlights the need for advanced monitoring tools. The qNOX index, generated by the Conox monitor, assesses nociception objectively and facilitates intraoperative adjustments. This study aimed to evaluate the correlation between qNOX values and intraoperative pain events in thoracic surgery.

Materials and Methods: A prospective observational study included 9 patients (mean age 68.3±7.6 years; 55% female; ASA II–III) undergoing scheduled thoracic surgery. Six received PVB, and three underwent TEA with general anesthesia. Exclusion criteria included emergency surgery, contraindications to regional techniques, and conditions impairing pain communication. Anesthetic protocols included TIVA with propofol and rocuronium, with remifentanil (0.1 μg/kg/min) for PVB cases.

Monitoring included qNOX, qCON, patient state index (PSI), and standard parameters (heart rate, MAP, SpO2). Measurements were taken at baseline, after laryngoscopy, pre-surgical incision, during surgery, and every 30 minutes. Pain events were defined as qNOX >60, heart rate or MAP increases >20% from baseline, or patient movement.

Results and Discussion: qNOX remained <60 for 88.2±17.0% of the intraoperative period, reflecting effective nociceptive control. Three patients had critical pain events (qNOX >60):

- A PVB case showed qNOX elevation 25 minutes into surgery, preceded by tachycardia and hypertension.
- Another PVB case had sustained qNOX >60 after VATS (videoassisted thoracoscopic surgery)-to-thoracotomy conversion.
- 3. A TEA case had qNOX >60 after laryngoscopy and early surgery, suggesting suboptimal catheter function.

qNOX correlated directly with PSI, with qNOX >60 coinciding with PSI >50, indicating nociceptive perception and inadequate anesthetic depth.

Conclusion: The qNOX index is a valuable tool for real-time nociceptive monitoring in thoracic surgery, enabling personalized analgesic adjustments. Its integration with PSI enhances anesthetic management by identifying critical moments requiring optimized analgesia and hypnosis. Ongoing patient recruitment aims to validate these findings and further explore correlations between regional techniques and monitoring parameters.

50AP02-4

Integrated pulmonary index for monitoring respiratory status in deeply sedated children during botulinum toxin injections: a prospective clinical cohort trial

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Background and Aim: Evaluating respiratory status solely based on oxygen saturation (SpO₂) or capnography (ETCO₂) may lead to delayed detection and interventions. The integrated pulmonary index (IPI) combines SpO₂, ETCO₂, respiratory rate, and heart rate into a single value between 1 and 10. This trial aims to evaluate the effectiveness of IPI in providing early warnings of respiratory compromise in deeply sedated children undergoing botulinum toxin injections.

Methods: This trial commenced after receiving approval from the ethics committee and written informed consent was obtained from families following the Helsinki Declaration. 70 children between 1-17 years of age were enrolled in this trial. All patients were premedicated with midazolam, sedation was achieved using 3 mg/kg propofol plus 1 mcg/kg fentanyl intravenously. A continuous propofol infusion at 125 mcg/kg/minute (min) was maintained to keep the bispectral index (BIS) level between 40-60. If the IPI decreased to ≤ 6, the propofol infusion rate was reduced by 25

²Wilcoxon rank sum exact test

mcg/kg/min, and the jaw thrust maneuver was applied. If the IPI decreased to ≤ 3, sedation was discontinued, and mask ventilation was initiated.

Results: The family of one child didn't give consent: thus, 69 children were analyzed. The gender distribution of pediatric patients was similar. The majority of the children were ASA-2, and 49 of them had only cerebral palsy. Others had additional epilepsy and hydrocephalus. Recorded values at 5-minute intervals for heart rate, blood pressure, respiratory rate, BIS, IPI, SPO,, and ETCO, were consistent among the groups after sedation. IPI ≤ 6 was observed in 51 (%74) out of 69 patients (p<0.001). ETCO2 had decreased more than %20 in 34 out of 69 children (%49) (p=0.042). 8 out of 69 patients' SPO₂ observed ≤ 92 (%12). 25 apnea occurred in these 69 children. IPI ≤ 6 was 24 of 25 apnea-detected children (%96). ETCO2 decreased more than %20 in 16 patients of these 25 (%64). $SpO_2 \le 92$ in 8 children of these 25 (%32). Decreasing sedation plus jaw thrust maneuver was applied in all apnea cases. Stopping sedation and administering mask ventilation were required in 4 patients who experienced apnea.

Conclusion: The Integrated pulmonary index, which combines four monitoring parameters, could be an early predictor of respiratory compromise in deeply sedated children.

Reference:

Kaur R, Vines DL, Liu L, Balk R.Role of integrated pulmonary index in identifiying extubation failure. Respir Care 2017;62:1555-

50AP02-5

Anaesthetic Considerations for the hinotori™ Surgical Robot System: a singapore-based experience

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Background: The hinotori™ Surgical Robot System, the first robotic platform developed in Japan, offers an alternative to the da Vinci system for laparoscopic surgeries. Early studies show comparable outcomes in urological procedures, positioning hinotori™ for broader adoption.[1] The system's unique design of undocked robotic arms and advanced optics introduces specific anaesthetic challenges. This report highlights the first Singaporean experience with hinotori™, focusing on key anaesthetic considerations for safety and outcomes.

Case Report: Teams underwent rigorous training in Japanese centres and rehearsed at Singapore's simulation lab. The first human case was a radical intra-peritoneal prostatectomy for a patient with prostate neoplasm. Anaesthetic protocols included IV Propofol, TCI Remifentanil, IV Rocuronium, and sevoflurane with end-tidal control. Port placement required 8 minutes, and robot docking took 12 minutes. The total surgical time was 127 minutes with a blood loss of 30 ml. The patient was positioned in lithotomy and steep Trendelenburg using non-slip silicone mats and secure strapping to maintain stability. Post-surgery, anaesthesia was reversed fully and the patient recovered uneventfully.

Discussion: Key anaesthetic challenges included non-docked robotic arms requiring precise positioning to prevent pressure on the patient's face, mitigated by a guardrail. The undocked ports pose a movement risk, managed through non-slip mats and straps. Advanced optics necessitated adjustments in ventilatory parameters to reduce respiratory artefacts. The hinotori™ system, despite its challenges, can be managed effectively to ensure perioperative safety and optimal outcomes. Ongoing experience and refinements will be crucial as the system is applied across various surgical disciplines.

References:

1. Miyake, H. & Fujisawa, M. (2024) 'Early experience and future prospects regarding use of newly developed surgical robot system, hinotori, in the field of urologic cancer surgery', International Journal of Clinical Oncology, 29(6), pp. 640-646. doi: 10.1007/s10147-024-02503-5.

Learning Points:

- 1. Careful patient positioning and equipment setup is necessary to mitigate risks associated with undocked ports and robotic arm movement.
- 2. Adjustments to ventilatory settings, including low tidal volume and paralysis, are critical to minimizing respiratory artefacts.
- 3. Ongoing experience is key to expanding the hinotori™ system's use across surgical disciplines.

50AP02-6

Virtual reality headset and peripheral nerve blocks for amoutation surgery: addressing the emotional and physical burden through innovative strategies

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Background: Amputation surgery poses significant emotional and physical challenges, especially in elderly patients with cardiovascular comorbidities. Alongside physiological demands, the psychological burden - including anxiety, fear, and emotional distress-often necessitates sedatives during regional anesthesia. Virtual reality (VR) is an emerging tool to manage perioperative anxiety, but its role in vascular surgery and amputations is underexplored.

Case Report: We report two cases of limb amputation in patients with heavy cardiovascular comorbidities, using peripheral nerve blocks and a VR headset, without sedative drugs or anxiolytics. An 82-year-old man underwent below-knee amputation with sciatic and femoral nerve blocks; a 66-year-old man had a forefoot amputation with saphenous and sciatic nerve blocks. The VR headset provided an immersive, calming experience, distracting patients from the surgical environment. There was no need to administer sedatives, oxygen or supplementary analgesia during the procedure. Both patients went to the ward after surgery, without the need for post-anesthesia care unit (PACU) surveillance.

Discussion: The VR experience, combining noise-cancellation headphones and verbal relaxation commands, was crucial in maintaining patient comfort and mitigating the emotional distress of limb loss. Postoperative assessments using the Quality of Recovery-15 (QoR-15)[1] and Evaluation du Vécu de l'Anesthésie Générale-Légère et Régionale (EVAN-LR)[2] scores revealed excellent recovery and high satisfaction, with no reported pain or discomfort. Both patients expressed willingness to undergo similar anaesthesia regimens in the future. VR offers a novel strategy to address the emotional challenges of amputation surgery by fostering relaxation and reducing perioperative stress. This innovative approach warrants further investigation to establish its potential to replace sedatives and analgesics, minimizing complications in high-risk patients. It also enhances perioperative care by reducing recovery times, avoiding PACU stays, and advancing patient-centered care.

References:

- 1. Axel et al. Development and Validation of Perioperative Satisfaction Questionnaire in Regional Anesthesia.
- 2. Kiani & Simbar. Development and Psychometric Evaluation of a Perioperative Quality Assessment Tool.

Learning Points: The potential of VR as a complementary tool in regional anesthesia with peripheral nerve blocks, advancing patient-centered care in amputation surgery.

50AP02-8

Electromyography vs. kinemyography in neonates, infants, toddlers and children - A monocentric randomised prospective agreement study – ETCETERA

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Background and Goal of Study: Neonates and infants are particularly susceptible to residual paralysis, which is aggravated by the lack of licensed quantitative neuromuscular monitoring (NMM) [1, 2]. We tested the precision of kinemyography (KMG) and electromyography (EMG) in children.

Materials and Methods: Four age groups of children (n=16 each) undergoing elective surgeries under sevoflurane anaesthesia were included: neonates including preterm born (≤44 weeks post-menstruation (p.m.)), infants (>44 weeks to ≤3 months p.m.), toddlers (>3 months to ≤2 years) and children (>2 years to <5 years). Calibrated NMM was performed using train-of-four (TOF) stimulation: KMG (Paediatric Mechanosensor, GE Healthcare) on one arm and EMG (children-sized, single-use electrode, Senzime) on the contralateral arm. Rocuronium was given aiming for a TOF count ≤2 and Sugammadex (2 mg kg-1) if the TOF ratio was <0.95 at the end of surgery. Primary endpoint was the precision of TOF ratios, expressed as repeatability coefficient (RC) with 95% confidence interval (CI).

Results and Discussion: A total of 64 children were enrolled, of which 32 were ASA I. 18 ASA II. and 14 ASA III. At baseline, the RC of KMG was 0.131 (0.130 to 0.132) and that of EMG was 0.093 (0.093 to 0.094) for all children. During neuromuscular recovery, the RC of KMG was 0.186 (0.186 to 0.187) and that of EMG was 0.171 (0.170 to 0.171). RCs of age groups are shown in Table 1. After sugammadex, 50 of 64 children reached a KMG TOF ratio >0.8, while 60 reached an EMG TOF ratio >0.8. More than one attempt was required to calibrate the KMG in 5 and the EMG in 2 neonates as well as the KMG in 4 and the EMG in 1 infant.

Conclusion: EMG was more precise than KMG, in particular in neonates (for whom no device is approved). Reasons for incomplete TOF recovery, even after sugammadex, must be investigated. As the RC indicates the range, in which the next value will be measured with 95% probability, improved precision is required to reliably protect especially neonates from unmonitored residual paralysis.

Table 1				KMG			EM		
	Age	Patients (n)	Measure- ments	RC	95% CI	Patients (n)	Measure- ments	RC	95% CI
200	Neonates	16	186	0.164	0.159 to 0.168	16	689	0.087	0.086 to
9	Infants	16	143	0.118	0.114 to 0.122	16	352	0.101	0.099 to 0.102
Baseline (before rocuronium)	Toddlers	16	159	0.101	0.098 to 0.104	16	332	0.108	0.106 to 0.109
8 5	Children	16	209	0.127	0.124 to 0.131	16	352	0.083	0.082 to 0.085
*	Neonates	9	243	0.494	0.483 to 0.505	15	410	0.180	0.178 to 0.183
F) (8.0%	Infants	12	379	0.188	0.185 to 0.191	15	366	0.176	0.173 k
Recovery (TOF ratio >0.8)	Toddlers	13	877	0.128	0.126 to 0.129	15	599	0.102	0.100 to 0.103
2	Children	16	1834	0.126	0.125 to 0.126	15	1677	0.186	0.185 to 0.187

References:

- 1. Klucka, J., et al., Residual neuromuscular block in paediatric anaesthesia. Br J Anaesth, 2019. 122(1): p. e1-e2.
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50AP02-9

Rapid determination of rocuronium bromide concentrations in beagles using portable mass spectrometer

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Background: This study investigates the application of a portable mass spectrometer (MS) for the rapid detection of Rocur concentrations in whole blood from beagles, with the aim of facilitating the development of individualized PK-PD models.

Materials and Methods: Four beagles aged 1 to 1.5 years and weighing 8 to 12 kg were included in this study. A single intravenous dose equivalent to 3 ED₅₀ (0.748 mg/kg) of Rocur was administered. Neuromuscular monitoring was conducted using the TOF ratio (TOFR). Blood samples (0.1 mL) were collected at predetermined intervals and recovery stages following Rocur administration, with the TOFR recorded at corresponding time points. Rocur concentrations in whole blood ($C_{\text{b-Rocur}}$) were determined using the Cell portable MS and the HPLC-MS for consistency comparison. Furthermore, a PK-PD model based on C_{h-Rocur} measurements obtained from the Cell portable MS was developed.

Results and Discussion: A strong linear relationship was observed for Rocur concentrations measured by the Cell portable MS within the range of 10-10,000 ng/mL (y = 1108.32 * x+ 14873.99, R^2 = 0.993). Both methods demonstrated that after injection, $\rm C_{b\text{-}Rocur}$ increased rapidly before declining. The $\rm T_{max}$ of $\rm C_{b\text{-}}$ $_{\text{Rocur}}$ was 0.5 minutes, with C $_{\text{max}}$ values of 4.52 \pm 1.16 $\mu\text{g/mL}$ (measured by the Cell portable MS) and 4.89 \pm 0.52 μ g/mL (measured by HPLC-MS), respectively. The mean concentration RSD for both methods was <15%. Results from the two methods showed a strong linear correlation ($y = 1.07 * x + 30.08, P < 0.0001, R^2 =$ 0.8948). As $\rm C_{b\text{-}Rocur}$ decreased, the TOF ratio gradually recovered, with an IC $_{50}$ of C $_{\text{b-Rocur}}$ determined to be 0.25 \pm 0.05 μ g/mL.

Conclusion: This study successfully applied the Cell portable MS for rapid quantitative analysis of Rocur concentrations in whole blood, demonstrating good consistency with the traditional HPLC-MS method.

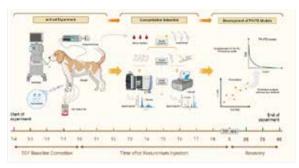


Figure 1. Workflow for the analysis of Rocur using the Cell portable MS.

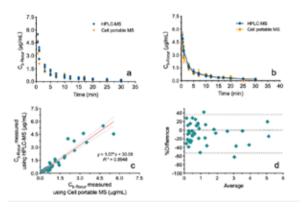


Figure 2 Full-scan mass spectrum of Rocur in blood samples measured using the Cell portable MS.

50AP02-10

Immersive virtual reality as adjunct to spinal anesthesia in two patients undergoing orthopaedic surgery in lateral decubitus position

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Background: Immersive Virtual Reality (IVR) is emerging as a nonpharmacological adjunct to anesthesia, providing the patient with a distraction from the intraoperative environment and potentially sparing the use of sedative agents and medical costs. Aditionally, lateral decubitus positioning in the operating room can cause neck and shoulder discomfort during surgery, in patients under spinal anesthesia. While this technology has already been applied in operating rooms worldwide, there is a lack of large scale studies analysing its clinical utility in different operative settings.

Case Report: In the present case report, we evaluate two patient's overall experience and satisfaction when using IVR as an adjunct to spinal anesthesia, in procedures requiring lateral decubitus positioning.

Discussion: The first patient underwent surgical reduction and osteosynthesis of a trimalleolar fracture and the second patient underwent total hip replacement. In both cases, the IVR glasses were turned on before the spinal anesthesia technique, with the patient in supine position. Afterwards, the patients were positioned in lateral decubitus and during the spinal anesthesia both remained distracted and calm, facilitating the technique. Throughout the surgical procedures, no sedative agents were used and there was no report of nausea or any other symptom of discomfort. During the postoperative period, the experience of both patients was assessed through the application of the QoR-151 and EVAN-LR2 scores, with both patients providing positive feedback. Even more significantly, the two patients stated in the postoperative interview that they would opt again for spinal anesthesia combined with IVR if they are ever in need of undergoing a surgical procedure in the future.

References:

1. Myles, Paul S et al. "Measurement of quality of recovery after surgery using the 15-item quality of recovery scale: a systematic review and meta-analysis." British journal of anaesthesia vol. 128,6 (2022): 1029-1039. doi:10.1016/j.bja.2022.03.009; ²Maurice-Szamburski, Axel et al. "Development and validation of a perioperative satisfaction questionnaire in regional anesthesia." Anesthesiologyvol. 118,1 (2013): 78-87. doi:10.1097/ ALN.0b013e31827469f2

Learning Points: Conducting these procedures with IVR as adjunct has the potential of reducing the use of sedative agents and consequently minimizing the risk of respiratory or hemodynamic complications and medical costs.

50AP02-11 Can ChatGPT4 write a narrative review on locoregional anesthesia?

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Background and Goal of the Study: ChatGPT4o, an Al model by OpenAI, can analyze, interpret, and generate text while retrieving information from diverse online sources. Its increasing use has raised questions about its reliability and validity for scientific research. This study evaluated ChatGPT-4o's ability to produce a narrative review based on pre-selected papers and specific instructions. The aim was to assess whether researchers and clinicians with limited AI expertise could use the tool effectively and to identify its strengths and limitations.

Materials and Methods: Between August and October 2024, a PubMed search identified studies on Continuous Paravertebral Blocks (CPVB) in thoracic surgery. The search used "Continuous Paravertebral Block" and "Thoracic Surgery" as terms and targeted RCTs, meta-analyses, and case reports published between 2000 and 2024. Studies on single-shot blocks, pediatric populations, and breast or cardiac surgery were excluded. Of 146 retrieved articles, 69 met inclusion. The selected articles were uploaded to ChatGPT-4 in groups of 10 due to system limitations. Instructions focused on CPVB efficacy, safety, adverse events (e.g., hypotension, urinary retention, pneumothorax), and benefits like improved pain scores and reduced opioid use. A 2,000-word limit was imposed on the review

Results and Discussion: ChatGPT-4o generated pertinent, wellstructured, and readable text that addressed key topics and provided additional insights beyond the instructions given. However, multiple iterations were needed to achieve a deeper analysis. Batch processing caused later uploads to predominate, limiting integration of earlier content. Defining and applying qualitative criteria for study evaluation was challenging. While ChatGPT-4o could outline these criteria, it was unclear if they were consistently applied. Some papers were omitted without explanation. and references required manual correction.

A study by Mostafapour et al. (2024) found ChatGPT-4o matched human reviews in accuracy but underperformed in contextual understanding. In our experience ChatGPT-4o excelled in speed and breadth of knowledge but struggled with methodological rigor.

Conclusion(s): ChatGPT-40 offers rapid synthesis and adaptability, making it a valuable supplemental research tool. However, its limitations in study quality assessment and methodological rigor require significant human oversight to ensure accuracy and reliability.

50AP02-12

Al detectives cracked the abstracts: evaluating correlation between tools in identifying artificial intelligence use in Euroanaesthesia 2024 abstracts!

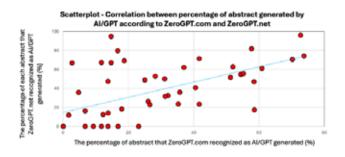
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Background and Goal of Study: The prevalence of artificial intelligence (AI) has brought forward increased usage in research articles in the medical field. The challenges we've come across include the questionable accuracy of the data it provides, unanswered ethical questions, the bias of said data, and the confidentiality risk that has not been resolved thus far, for the sake of proper and reliable use. Tools like ZeroGPT.com and ZeroGPT.net are commercially available and designed to detect Al-generated texts. Their effectiveness relies on their ability to analyze syntax, linguistic patterns, and repetitions characteristic of Al-generated content. The aim of this study is assessing correlation rate between these two AI detection tools in identifying AI usage in scientific abstracts.

Materials and Methods: Fifty abstracts were selected from the Euroanaesthesia Abstract Book 2024 for analysis. These included case reports and non-case reports. All texts were analyzed using ZeroGPT.net and ZeroGPT.com in order to detect the percentage of Al usage in the abstracts. Pearson's correlation coefficient was used to evaluate the relationship between the two programs' detection rates.

Results and Discussion: Results are shown with a scatterplot. 6 out of 50 abstracts (12%) had high discrepancies rate (>50%). while 21 out of 50 (42%) had almost no difference (<0,4%) in detecting Al usage between ZeroGPT.com and ZeroGPT.net. Pearson's correlation coefficient was 0.5958, which indicates a moderate correlation between these tools in the success ratio of recognizing Al use. Although a moderate positive correlation exists between these two tools in detecting percentage of Al usage in abstracts, caution is advised as significant discrepancies were observed in some cases showing that these two tools are not consistent.

Conclusion(s): ZeroGPT.com and ZeroGPT.net show potential in identifying Al-generated content but their moderate correlation and observed inconsistencies indicate that caution is needed in interpreting the results. There is a need for development of better and more accurate tools for the detection of Al.



50AP03-1

Ultrasound assessment of the gastric content in scheduled surgery (ecoGAS Pro study)

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Background and Goal of Study: Throughout various publications, the recommended fasting hours before surgery have varied, depending on the type of patient, the type of surgery, and kind of intake. However, these recommendations are still based on expert consensus without objective evidence of the actual gastric content resulting from the fasting hours.(1)

In our study, we aim to assess through gastric ultrasound whether adhering to the current fasting recommendations (6 h. for solids and 2 hours for liquids) ensures the absence of residual gastric content at the time of anesthetic induction.

Materials and Methods: We propose a pivotal, observational, prospective, and non-randomized study, in which members of the Anesthesiology Service will measure, via bedside ultrasound in the pre-operative area, the gastric residue of patients scheduled for surgical intervention just before anesthetic induction fasting at least 6h.

The main variable will be the gastric volume measured based on the cross-sectional area of the antrum measured in the right lateral position combined with the patient's age. The result is obtained following this equation:(2)

VOL (ml) = 27 + (14.6 x Right Lateral CSA (cross-sectional area of the antrum)) - 1.28 x Age.

According to the value obtained in milliliters, we will divide the sample into two groups. Solid or liquid content greater than 1.5 ml/kg will be considered a full stomach, and no solid or liquid content inferior to 1.5 ml/kg will be considered an empty stomach.(3) Obesity, diabetes mellitus, hepatic failure, kidney failure were considered as possible risk factors in the delay of the gastric emptying.

Results and Discussion: As a pivotal study, we included 35 patients. 32/35 had empty stomach and 3/35 was categorized as full stomach (all due to a high liquid content, none with solid content.) In the first group 10/32 had at least one risk factor to delay the emptying and in the second one only 1/3 had a risk factor.

Conclusion(s): Our preliminary study showed that most patients had an empty stomach when following main recommendations, even with risk factors for delaying the emptying. Nevertheless, some patients had a full stomach after at least 6 h fasting, what should make us to be cautious in all scheduled inductions.

References:

- 1. Crowley, M et al. Hentet 2020.
- 2. Gastricultrasound.or. Accessed 4th Dec 2024.
- 3. Gómez-Ríos MÁ, et al. Rev Esp Anestesiol Reanim 2024.

50AP03-2

Comparison of simultaneous electromyographic responses from the adductor pollicis and abductor digiti minimi muscles during rocuronium-induced neuromuscular block

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Background and Goal of Study: Recent neuromuscular monitoring (NM) guidelines endorse the use of quantitative monitors (Thilen 2023), specifically recommending the adductor pollicis (AP) muscle. However, many clinicians monitor the abductor digiti minimi (ADM) muscle using electromyography (EMG).

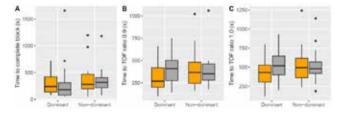
We aimed to evaluate the performance of the two muscles using EMG during onset and recovery from nondepolarizing block.

Materials and Methods: NM used the EMG-based TetraGraph (Senzime, Sweden); one electrode (TetraSens) was placed over the ulnar nerve (stimulating electrodes) and the thumb (recording electrode) to measure the AP muscle response on one hand, and another TetraSens was placed over the ulnar nerve (stimulating electrodes) and the hypothenar eminence to measure the ADM muscle response on the opposite hand.

In half of measurements, the AP was monitored on the dominant hand (DH), while in the other half, the ADM was monitored on the DH. Simultaneous train-of-four (TOF) stimulations every 20 sec were applied to both ulnar nerves while cMAP responses were recorded from the two muscles simultaneously during onset and recovery of neuromuscular block until TOF ratio >0.90.

The primary outcome was onset time (sec), level of block prior to reversal (TOF ratio), and the rate of recovery of the AP and ADM muscles.

Results and Discussion: Wilcoxon signed rank tests showed no significant differences in time to complete block, time to TOF ratio 0.9, or time to TOF ratio 1.0 between ADM and AP measurements (p > 0.08).



Boxplots of time to complete block (A), to TOF ratio 0.9 (B), and to TOF ratio 1.0 (C) in ADM measurements (in orange colour) and AP measurements (in gray colour) at the dominant and non-dominant hands. Boxplots show median (thick horizontal line), interquartile range (box), range (vertical lines) and outliers (dots). (n=46)

Conclusions: The principal finding is the lack of significant differences in key metrics related to neuromuscular block monitoring (onset and recovery) between the AP and ADM muscles. This result indicates that either muscle group can serve as an effective monitoring site for assessing neuromuscular function during surgery.

50AP03-3

Unveiling the code: how effective are Al detection tools in Euroanaesthesia abstracts 2024?

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Background and Goal of Study: ChatGPT was developed by OpenAl and was launched in 2022. Since it was introduced it has found a place in the academic community and in research articles in medical field. ZeroGPT.com and ZeroGPT.net are commercially available detectors created for the detection of the Al.

The aim of this study is to detect the percentage of Al usage in abstracts from Euroanaesthesia Abstract Book 2024.

Materials and Methods: 50 abstracts from the ESAIC Abstract Book 2024 were selected for analysis. Case reports and noncase reports from Japan, Turkey, the USA, the UK, Albania, North Macedonia, Greece, Portugal, and Switzerland were selected. Differences between AI usage percentages were tested either with the t-test or the Mann-Whitney U test.

Results and Discussion: According to ZeroGPT.com. case reports had 27.7%±26.52%* Al usage, while non-case reports had 41.21±30.58%*. There was no statistically significant difference between these two groups(P=0.107). Using ZeroGPT.net,case reports had 23.1(14-32 %)* Al usage, while non-case reports had 16.8 (7-52 %)*. There was no statistically significant difference between these two groups (P=0.857).

According to ZeroGPT.com,Portugal had the lowest percentage of Al usage(11.54±13.32%*), while according to ZeroGPT.net, Turkey had the lowest (20.82±17.66 %*).

Both tools identified Switzerland as having the highest percentage of Al usage:46.93±39.51%* with ZeroGPT.com and 39.53±31.21%* with ZeroGPT.net. According to ZeroGPT.net, English-speaking countries had an AI usage of 29.26±27.42%*,while non-English-speaking countries also showed 29.26±27.42%*. There was no statistically significant difference between these two groups(P=0.557).

Even though it was expected that case reports have lower AI usage than non-case reports, but no statistically significant difference was found. This may be due to the fact that a major part of a case report can be written using an Al.

Another interesting result is that there was no statistical difference between English and non-English-speaking countries. This can be explained by the widespread and growing accessibility of Al technology.

*Results are shown as average ± standard deviation or median (interquartile range).

Conclusion(s): There are geographical differences in the percentage of AI usage. Even though ZeroGPT.com and ZeroGPT.net have the potential to identify Al-generated content, their results may show inconsistencies; therefore, caution is needed when interpreting them.

50AP03-4

Divergent interpretations between the CONOX monitor and Surgical Plethysmographic Index (SPI) on the nociceptive response during open hemihepatectomy

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Background: In anesthesiology, the correct perception and management of nociception is essential. The comparison between CONOX and SPI provides insight into the interpretation of pain in the surgical context.

Case Report: A 53-year-old patient undergoing open hemihepatectomy. A thoracic epidural catheter was placed at T9 with 0.125% Levobupivacaine infusion. No opioids were administered. Desflurane at 5% was used for anesthetic maintenance. During the procedure, both the cava and portal veins were partially clamped, preventing venous return. Although the trends of qNOX and gCON showed a parallel behavior, with gCON about 10 to 15 points above gNOX, the SPI indicated nociception.

Discussion: Functional thoracic epidural anesthesia is the gold standard for ensuring a pain-free patient during abdominal surgery⁽¹⁾, providing effective analgesia and minimizing the side effects of opioids. In this scenario, the parallel and constant behavior of gNOX and gCON on the CONOX monitor suggests that the patient is adequately anesthetized and not experiencing pain, consistent with the effective use of thoracic epidural anesthesia. However the SPI, which relies on pulse wave and heart rate variability to infer nociception, interpreted the hemodynamic change due to clamping as a sign of pain(2).

It is crucial to understand how both devices infer nociception. CONOX analyzes EEG trends to determine both anesthetic depth (gCON) and nociceptive reflex (gNOX)(3). In contrast, SPI interprets hemodynamic changes to determine nociception⁽²⁾, which can lead to misinterpretations in situations like vascular clamping. In this particular case, the SPI misinterpretation could have led to overadministration of analgesics, potentially compromising patient safety.

The presented clinical situation highlights the need for careful interpretation of data provided by these tools and the importance of contextualizing information within the clinical and surgical scenario.

Learning points: : While CONOX and SPI are valuable tools for monitoring nociception, it is essential to understand their mechanisms and potential limitations. Proper and contextualized interpretation is vital to ensure patient welfare and safety in the operating room.

50AP03-5

Integrating automated feedback in resident education: EpiFaith CV for Central Venous Catheterization training

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Background and Goal of Study: Central venous catheterization (CVC) is a critical skill for anesthesiology residents, demanding precise execution to prevent complications such as arterial dilatation. Pressure monitoring typically involves connecting external monitoring systems, which can increase procedural complexity. The EpiFaith CV syringe, equipped with automated feedback, provides real-time high-pressure detection (>30 mmHg), offering the potential to enhance procedural safety and training efficiency.

This study evaluates the impact of EpiFaith CV on adherence to procedural standards and its effectiveness in resident education.

Materials and Methods: Five first-year residents, each with fewer than 20 prior CVC procedures, underwent institutional training, including conventional syringe techniques, EpiFaith CV instructional videos, and silicone phantom practice. Three residents started with the conventional syringe, transitioning to EpiFaith CV, while two followed the reverse sequence.

Each resident performed 15 procedures with both techniques (n=150). All procedures were supervised, with faculty intervention provided as needed. Residents completed post-procedure selfassessments covering independent completion, procedural duration, the occurrence of arterial puncture, and subjective ratings (confidence, ease, satisfaction).

Results and Discussion: EpiFaith CV showed a higher independent success rate (94.7% vs. 88.0%) compared to the conventional syringe, though not statistically significant. Procedural times were similar (59.1s vs. 59.0s). The incidence of arterial puncture was low and comparable between both methods.

No arterial dilatation happened. User ratings for ease and satisfaction were slightly lower with EpiFaith CV, likely due to a learning curve and additional procedural steps. Confidence ratings were similar across methods.

The findings highlight EpiFaith CV's potential to maintain procedural safety while introducing automated feedback into training. Conclusion(s): EpiFaith CV is a viable tool for enhancing resident education in CVC, providing comparable safety and efficiency to conventional methods. Further optimization of training processes is needed to address the learning curve and maximize the benefits of automated feedback. Expanding the study size is recommended to confirm the findings.

Reference:

Tsai YY, Fu CH, Huang HH, Chan KC, Lin PL, Wang ML. Automated feedback in central venous catheterisation training. Med Educ. 2024.

50AP03-6

Automated machine learning for ASA-PS prediction: Leveraging demographic, medication, and questionnaire data from routine preoperative

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Background and Goal of Study: The American Society of Anesthesiologists Physical Status (ASA-PS) classification is essential for perioperative risk stratification, payment systems, and determining suitability for day surgery centers. Its subjectivity limits reliability.

This study used machine learning (ML) models, developed with H2O's AutoML1, to predict ASA-PS classes I-IV (multiclass) and binary classifications (I&II vs. III&IV) based on routine preoperative data (demographics, BMI, and Anatomical Therapeutic Chemicalcoded (ATC) medication and health questionnaires).

Materials and Methods: This retrospective study at Erasmus MC, Netherlands, used data (2018-2023) meeting criteria (age ≥18, ASA-PS classifications I-IV, validated medication, and completed questionnaires). Three datasets included 50,431 cases (demographics, BMI, medication), 32,600 cases (demographics, BMI, questionnaire), and 28,582 cases (combined). H2O's AutoML trained models using algorithms such as Generalized Linear Models, Random Forest, Gradient Boosting Machines, Deep Neural Networks, and ensembles (combinations) for improved performance. Metrics included F1 score, accuracy, precision, recall, and area under the receiver operating characteristic curve (AUC-ROC). Calibration curves assessed reliability; explainability analyses identified key predictors.

Results and Discussion: Binary classification models using demographics, BMI, and medication achieved an F1 score of 0.78, accuracy of 0.77 and AUC-ROC of 0.85. Using questionnaire data instead of medication improved performance slightly (F1: 0.79, accuracy: 0.78, AUC-ROC: 0.86). Combined data performed best (F1: 0.83, accuracy: 0.82, AUC-ROC: 0.90). The best multiclass model (all data) achieved an F1 score of 0.64, accuracy of 0.64 and AUC-ROC of 0.88. Medication-only models perform comparably to combined data, offering efficiency where questionnaires are unavailable. Reliability was confirmed, and key predictors were highlighted. Validation in other settings is needed to ensure generalizability.

Conclusion(s): Demographics, BMI, and medication enable effective ASA-PS prediction. Enhanced models with questionnaires may perform better in specialized settings. This study highlights the potential of routine healthcare data and machine learning tools to improve perioperative workflows.

References:

1. LeDell E, Poirier S. H2O AutoML: Scalable Automatic Machine Learning. In: 7th ICML Workshop on Automated Machine Learning, 2020.

50AP03-7

From paper to Al: Transformation of the surgical area management model based on technology and process management

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Background and Goal of Study: The Surgical Area is a key component of hospitals around which concentrate many of the care processes and resources. We decided to implement a structured management model supported by digital tools, which provides quality data at each level of decision-making and contributes to the implementation of a new work model based on planning and empowerment.

The impact areas where it is tempted to influence:

- 1. Facilitate day-to-day management.
- 2. Effective and efficient model of planning and scheduling.
- 3. Improving patient experience.
- 4. Facilitate natural team coordination.
- 5. KPI acquisition.

Materials and Methods:

- 1. ANALYSIS AND PROCESS DESIGN. Prior analysis and redesign of the processes that guarantee that the implementation of the technological tool is adapted to the specific needs. We set up working groups (WG) as essential step to get qualitative and relevant data, and performance, and to develop the Value Stream Map.
- 2. IMPLEMENTATION, TECH DEPLOYMENT AND SYSTEM MAINTENANCES. Work on the information between systems in the tasks of integration, network points and cabling necessary to supply and network the equipment and identify the necessary
- 3. TRAINING. A fundamental element of change management to help all professionals adapt to he new work situation and favoring the work philosophy of continuous improvement.
- 4. SUSTAINABILITY AND MAINTENANCE Accompanying professionals in the correct use of technology and monitoring the efficiency of the surgical area, ensuring that it becomes a regular practice and promoting a culture of continuous improvement of results. Work will be done on the definition of key indicators, their associated objectives, and on monitoring the evolution and the degree of compliance.

Results and Discussion:

- 1. IMPROVING TACTICAL SCHEDULING. Empowerment and effectiveness of the Operating Theatre Committee and Surgical Programming Center. Better efficiency in scheduling.
- 2. IMPROVING PATIENT EXPERIENCE AND PROFESSIONAL PERFORMANCE. (Real Time Location System). Patient's Families and providers receive information about the perioperative flow.
- 3. STRATEGIC PLANNING MODULE. New AI supported tool is the best result, providing new dashboards and scenario simulation of surgical planning.

Conclusion(s): We achieved a more agile management, more efficient use of resources and improving the satisfaction of care providers and patient experience. New AI tool to simulate OR planning scenarios.

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50AP03-8

Prediction of volume responsiveness by using end-expiratory occlusion test in a patient with severe diastolic dysfunction undergoing hepatectomy: a case report

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Background: Hemodynamic management in major surgeries in patients with diastolic dysfunction can be challenging. Assessment of fluid responsiveness using end-respiratory occlusion test is an underutilized technique, which allows adequate volume titration and use of vasoactive drugs in critically ill patients.

Case Report: A 49-year-old man, diagnosed with systolic dysfunction (Simpson LVEF 34%) and diastolic dysfunction grade III, idiopathic. Surgery was left hepatectomy. Patient was monitored by the ASA standard in addition to insertion of an invasive arterial pressure in the right radial artery coupled to the cardiac output monitor (FLOTRAC®) and central venous access was placed into right internal jugular vein.

Anesthetic technique of choice was total intravenous general anesthesia associated with an epidural catheter placed at T11-T12. For goal-guided volume replacement, the end-expiratory occlusion pressure test was used. Test was performed in two moments of hemodynamic instability during the intraoperative period, with apnea of 15 seconds. Cardiac output variation of 4.2 to 5.8 L/min (38%) was obtained in the 1st test and 3.9-6.7 L/min (71%) in the 2nd test

After the test, 250 mL of Ringer lactate was used and an increase of 21% and 42% was observed in cardiac output, respectively. Patient received a total of 3500 mL of intraoperative fluids. Transferred to the Postoperative Intensive Care Unit, hemodynamically stable and in spontaneous ventilation, being discharged on the 8th postoperative day.

Discussion: The use of dynamic methods to guide fluid replacement is essential for perioperative hemodynamic management in high-risk cardiovascular patients. These strategies ensure adequate oxygen delivery to the tissues, reducing the side effects of excessive fluid use. Although studies are still conflicting, the volume prediction technique using the end-expiratory occlusion pressure technique is an accessible and reproducible method to optimize intraoperative hemodynamic management.

Reference:

Velmurugan Selvam, Dilip Shende, Anand RK, Kashyap L, Ray BR. End-expiratory Occlusion Test and Mini-fluid Challenge Test for Predicting Fluid Responsiveness in Acute Circulatory Failure. Journal of Emergencies, Trauma, and Shock. 2023; 16 (3):109-15. Learning points: Goal-directed fluid therapy can optimize hemodynamic management in major surgeries and, thus, minimize the side effects of inappropriate use of vasopressors or excessive fluid.

50AP03-9

Automatic detection of circulatory arrests using smartwatch technology: First results

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Background and Goal of Study: Out-of-hospital cardiac arrest (OHCA) is a leading cause of mortality worldwide. Early detection and alarming of emergency medical services (EMS) are key challenges in the chain of survival, as they currently depend entirely on the presence of bystanders.

This study provides a proof of concept for a device-independent application capable of automatically detecting OHCA using smartwatch sensor signals.

Materials and Methods: Participants included volunteers (n = 3) in which we temporarily ceased the blood flow in the arm, 4 times, using a blood pressure cuff inflated to 300 mmHg, and patients undergoing cardiac surgery or cardiological procedures involving temporary artificial cardiac arrest (n = 6).

Photoplethysmography (PPG) sensor data were collected from Samsung Galaxy Watch5 smartwatches and events were annotated. A preliminary cardiac arrest detection algorithm was developed and evaluated using the raw sensor data collected.

Alarms in the absence of annotated circulatory arrests were considered false positive alarms. Moreover, we established connectivity with a virtual dispatch center to test whether the system is capable of alerting Emergency Medical Services in the case of a detected OHCA.

Results and Discussion: In total, 9 participants were included in the study. Our preliminary algorithm positively identified all subjects as having a spontaneous circulation prior to the onset of circulatory arrest (specificity 100%) and also identified circulatory arrest at the wrist in most patients (sensitivity 94%).

Moreover, the connectivity with the virtual dispatch center worked as intended, demonstrating the potential of the system to not only detect OHCA but to also trigger an emergency response.

A key limitation is that the algorithm, for the purpose of demonstrating a proof-of-principle, was developed and tested using the same dataset. This approach likely overestimates the algorithm's diagnostic accuracy. More data and real-world settings are needed to evaluate the true performance.

Conclusion(s): We have demonstrated as a proof of concept that it is feasible to automatically detect circulatory arrest using commercially available smartwatch sensors, achieving excellent sensitivity and specificity with limited data.

This technology holds significant potential to reduce response times and improve survival outcomes. Future research should focus on real-world testing and integration with EMS to fully realize its potential.

50AP03-10 Assessment of nociception with the CoreSafe

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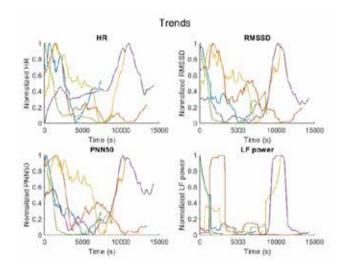
Background and Goal: This study assesses the CoreSafe One (CoreSafe, Barcelona, Spain) for developing a neuro-autonomic states (NAS) index to quantify autonomic nervous system changes related to nociception during sedation and analgesia.

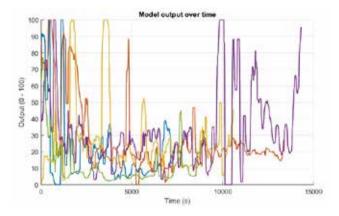
Data from five surgical patients and five healthy subjects were analyzed using HRV metrics (HR, RMSSD, PNN50, LF power) as inputs to an Adaptive Neuro-Fuzzy Inference System (ANFIS) model to classify analgesia versus no-analgesia states.

Materials and Methods: Ten participants – five surgical patients and five healthy subjects - provided ECG data collected via Core-Safe after IRB approval. Surgical patients were monitored for 3-5 hours. HRV metrics were extracted from noise-filtered ECG signals, and physician annotations categorized data into analgesia (0) and no-analgesia (1) states. An ANFIS model trained on normalized HRV metrics was validated using leave-one-out crossvalidation.

Results and Discussion: HRV analysis revealed a significant decline in HR, RMSSD, PNN50, and LF power during analgesia, reflecting reduced autonomic nervous system activity. The ANFIS model classified analgesia and no-analgesia states with 76.92% accuracy, achieving a precision of 86.82% and recall of 80.89% for the no-analgesia state.

The ROC curve demonstrated an AUC of 0.80. Application of the NAS index to surgical data showed the index remaining relatively flat. While the model performed well, challenges such as overlapping signal characteristics and artifacts during state transitions highlight areas for refinement.





Conclusion: The CoreSafe One shows potential for developing a NAS index to monitor nociception during surgery. While promising, further work is needed to improve data size, artifact handling, and state transition definitions, enhancing its reliability as a noninvasive tool for nociception monitoring.

50AP03-11 ATHENA: Virtual anaesthetic consultations – From human to Al-assisted anaesthesia

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Background: ATHENA represents a paradigm shift in anaesthesia, transitioning from traditional human-led to Al-assisted processes. Traditional preoperative assessments (PA) are timeconsuming and resource-heavy consultations. ATHENA addresses this by integrating AI technology and 3D imaging to automate consultations. Our prototype ATHENA app marks first steps towards Al-driven PA.

Methods: The study enrolled 25 participants. An avatar guide standalone app for automated PA was developed using image processing. ResNet neural network and for neck tilt posture system/trigonometric method including CSRT trackers using side images for ground truth comparison. Participants performed exercises that allowed the AI system to classify their Mouth Opening, Mallampati scores (1+2 and 3+4) and Neck tilt. The Al's assessments were then compared to an anaesthesiologist's evaluation of 794 still images.

Results: The ATHENA app correctly predicted mouth openings over 4 cm in 72% of cases, however no correlation was found between manually calculating mouth height and system's mouth opening increase. It accurately classified 63.4% of patients' Mallampati scores and on average tended to overshoot 25.2 degrees in both forward and backward tilt calculations. A qualitative study reported high user satisfaction, indicating that users found the avatar guidance sufficient and trustworthy.

Discussion and conclusion: ATHENA project lays the early groundwork to develop avatar guided Al assisted PA which, when finally implemented, could triage patients into three categories: red: physical PA needed, yellow: Al evaluation requires anaesthetic second opinion on video material, and green: patient is ready for surgery. Addressing the future double demographic pressure and worldwide shortage of healthcare personnel. The prototype was by no means flawless but underlines the importance of avatar guiding patients in how to perform airway assessment exercises correctly. A live adaptable avatar to patient's actions is a future necessity. Further development and inclusion of visual data on more diverse patient groups are required to improve the ATHENA app before tested clinically.

50AP03-12

Clinical validation of oscillometric blood pressure using a multiparameter monitor in anaesthetised dogs

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Background and Goal of Study: Intra-operative hypotension (mean arterial pressure [MAP] <60 mmHg) is one of the most common complications in anaesthetised dogs due to anaesthetic-induced depression of sympathetic tone. Untreated hypotension is associated with increased morbidity and mortality in dogs during the post-anaesthetic period. This study aims to compare non-invasive blood pressure (NIBP) with invasive blood pressure (IBP) from a Mindray multi-parameter monitor in anaesthetised dogs, as both methods are currently accepted for blood pressure monitoring.

Materials and Methods: 14 Client-owned adult dogs, classified as ASA II animals, were anaesthetised for various surgical procedures using different anaesthetic protocols. Measurements were obtained using the Mindray Bennevion N15 multi-parameter monitor via a pneumatic cuff placed over the medial dorsal artery (NIBP) and a transducer connected to a catheter placed in the contralateral artery (IBP). Data were recorded using Mindray software and paired readings for MAP, systolic and diastolic blood pressure (SAP and DAP, respectively) were matched every 5 minutes during surgery. 266 Paired blood pressure measurements were analysed using the Bland-Altman test, which assessed the agreement between IBP and NIBP and its clinical significance. Data were reported as mean bias (lower, upper limits of agreement (LoA)).

Results and Discussion: Analyses of agreement showed biases of 5.13 mmHg [95% limits of agreement (LoA); -31.7 to 41.3 mmHg] for SAP values, 1.61 mmHg [95% LoA -18.3 to 22.05 mmHg] for DAP and 0.605 mmHg [95% LoA -23.051 to 24.262 mmHg] for MAP. Considering the complete data set, the precision was acceptable as the SD of the differences between paired measurements was less than 15 mmHg for all parameters (DAP=6.8; MAP=7.8; SAP=11.2). The mean bias for SAP, DAP and MAP measurements was positive for all subsets, indicating that NIBP measurements were underestimated compared to IBP measurements (Figure 1).

Conclusion(s): NIBP measurements using the Mindray multiparameter monitor were generally in agreement with IBP measurements obtained during general anaesthesia and appear to be suitable for use in dogs. However, inaccuracies, often underestimations, observed with NIBP measurements should be interpreted with caution, especially with regard to the use of drugs to maintain normotension during anaesthesia.

50AP04-1

Can Artificial Intelligence (AI) algorithms predict the risk of post-induction hypotension in cesarean section operations using only preoperative data?

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Background and Goal of Study: Al is a core component of new clinical tools being developed for predicting adverse intraoperative events like hypotension during a cesarean section, which can affect not only the mother but also the baby. Therefore, this study aimed to develop deep learning algorithms to predict the risk of post-induction hypotension in cesarean section operations under spinal anesthesia.

Materials and Methods: After this study was approved by the Hacettepe University Clinical Research Ethics Committee, we prospectively analyzed preoperative data from 370 patients undergoing cesarean sections with spinal anesthesia, comprising 122 unique features. Using univariate feature selection, we refined this set to 50 key predictors, optimizing model performance and interpretability. Eight deep learning models were evaluated, including four variations of Fully Connected Neural Networks (FCNN), two 1D Convolutional Neural Networks (1D-CNN), and two Long Short-Term Memory (LSTM) models. Each model was assessed with 10-fold cross-validation for robust evaluation.

Results and Discussion: Averaging the 10-fold cross-validation results, the FCNN-2 model emerged as the top performer, achieving an AUROC score of 0.6883. Statistical analyses revealed risk factors, such as age over 30, history of hypotension in previous cesareans, reduced intravenous fluid volume at hospital admission, elevated CRP levels, and the presence of diabetes mellitus. Conversely, regular iron and multivitamin use emerged as protective factors against hypotension. Preoperative Syndecan-1 levels were found not to have a significant association. In terms of model feature importance, in addition to these features, the following are also important for the occurrence of hypotension: Elevated MCV, ferritin, and D-dimer levels, presence of polycystic ovary syndrome, hypertension, extended fasting duration before surgery. The only significant feature related to spinal anesthesia was the dose of bupivacaine.

Conclusion(s): This study successfully developed a predictive model (FCNN-2) for hypotension risk in cesarean patients under spinal anesthesia, achieving an AUROC of 0.6883. This model has potential clinical utility as a preoperative screening tool, identifying patients at higher risk for hypotension. With preoperative identification, clinicians can implement tailored interventions to mitigate hypotension risk and enhance maternal-fetal outcomes.

50AP04-2

Brain injury monitored by bispectral index and near-infrared spectroscopy in cardiac surgery

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Background: Severe intraoperative cerebral hypoperfusion is a critical issue in cardiac surgery, particularly in patients with complex cardiovascular disease. Non-invasive monitoring techniques (BIS (Bispectral Index), DSA (Density Spectral Array) and NIRS (Near-Infrared Spectroscopy)1) can help us to manage it

Case Report: A 77-year-old woman presented for aortic valve replacement due to severe aortic regurgitation, severe left ventricular dysfunction and moderate pulmonary hypertension. Anaesthesia induction was with invasive arterial monitoring, BIS, bilateral NIRS, DSA, transesophageal echocardiography and cardiopulmonary bypass (CPB). Intra-operatively there was massive bleeding due to accidental cannula removal. Coma was induced with pentothal, together with 100% FiO2 ventilation and hypothermic manoeuvres for neuroprotection. During cardiac arrest, cerebral monitoring parameters deteriorated. The source of bleeding was identified and corrected, allowing the operation to be continued. Immediately after aortic clamping, severe alterations in cerebral monitoring persisted, including delta wave activity on DSA, a suppression rate of 100% and BIS value of 0. Surgical field inspection revealed no compromise of the brachiocephalic trunk and surgery was continued. Nevertheless, after aortic unclamping, brain monitoring parameters improved. Post-operatively, the patient was transferred to the ICU intubated and sedated. There was delayed wakefulness and left-sided brachial-crural hemiparesis. MRI revealed a stable ischaemic lesion in the right fronto-subcortical region, that could explain the clinical presentation and intraoperative findings

Discussion: This case underscores the crucial role of cerebral monitoring in cardiac surgery under general anesthesia to prevent long-term deficits. Despite the absence of surgical evidence indicating impaired cerebral perfusion, the non-invasive monitoring tools provided early detection of significant cerebral hypoperfusion

References:

1. Sinha et al. "Changes in BiSpecteral Index Values During Cardiopulmonary Bypass" doi:10.1016/S0377-1237(11)80009-2 Learning Points: Advanced monitoring techniques can provide crucial insights into intraoperative, enabling timely interventions. Cerebral hypoperfusion can occur in cardiac surgery without direct surgical field compromise. However, early identification of the problem allows the medical team to act much more effectively and improve patient's outcomes.

50AP04-5

Integrating anesthetic variables into machine learning for enhanced surgical time forecasting

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Background and Goal of Study: Accurately predicting operation duration is critical for efficient operating room scheduling and resource allocation. The introduction of machine learning models to predict operation duration offers a data-driven approach that enhances the efficiency of scheduling. Previous studies have demonstrated that machine learning models can effectively predict operation duration, but most predictions overlook critical anesthesia factors.

In this study, we address the limitation by integrating anesthesia factors into machine learning models, aiming more accurate predictions.

Materials and Methods: Data from all cases utilized the operating room of our institute, performed between February 2014 and July 2021, were collected. Emergent procedures, patients classified as ASA V, or cases missing key data were excluded. Features selected for prediction includes patient, procedure, and anesthesia factors. Several algorithms are chosen and compared, and the performances of the models are evaluated based on mean absolute error (MAE).

Results and Discussion: 106.306 cases are included after data exclusion and preprocessing. The dataset is randomly split into 80% for training and 20% for validating. The following table summarizes the performances of the algorithms across two different feature sets. Feature set 1 includes all features, while feature set 2 excludes anesthesia factors, to compare the impact of anesthesia factors.

Algorithms	Feature set 1, MAE (minutes)	Feature set 2, MAE (minutes)	
Linear Regression	33.09	34.29	
Gradient boosting regression	36.05	41.12	
Random forest	31.15	33.48	
Bagged trees	31.09	33.07	
Multi-layer perception regression	30.42	33.80	
Supported vector regression	28.53	29.02	

Table. Prediction Outcomes for all Algorithms.

In general practice, prolonged surgeries are typically performed under general anesthesia rather than regional anesthesia for patient comfort; and advanced techniques, such as arterial line or central venous catheter, are often prepared for complex procedure or high-risk patients. These make anesthesia factors strong predictors for prediction of the operation duration.

Conclusion(s): Our study demonstrates that incorporating anesthesia factors into machine learning models improves the accuracy of operation duration predictions.

50AP04-7

Comparison of cardiac index values between VenArt® device and transthoracic echocardiography during anesthesia for laparoscopic gynecological procedures

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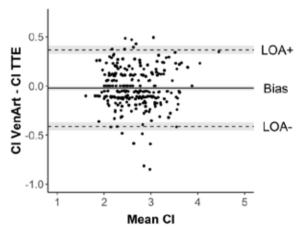
Background and Goal of Study: Non-invasive cardiac output (CO) monitoring during anesthesia for gynecological procedures needs to be simple yet accurate. Transthoracic echocardiography (TTE) is non-invasive but skill-dependent and only provides intermittent measures. The VenArt® device (Mespere life sciences, Waterloo, Ontario, CA) provides a non-invasive beat-by-beat CO based on the Fick principle, measuring the differences in saturation between venous and arterial blood using near-infrared spectroscopy (NIRS). The input of patient's height and weight allows for the derivation of cardiac index (CI).

This study aimed to compare CI values using the VenArt® device with TTE in gynecological laparoscopic surgery.

Materials and Methods: This single-center prospective observational study included adult women (ASA 1-3) undergoing laparoscopic gynecological surgery. CI was measured simultaneously at five perioperative time points expected to involve substantial haemodynamic fluctuations using the VenArt® device and TTE (single operator). Agreement between methods was assessed using Bland-Altman analysis providing bias, precision, mean percentage error (MPE) and limits of agreement (LoA).

Results and Discussion: Fifty-five patients (ASA 1/2/3 n=8/45/2; mean age 44.1 (±10.8) years; BMI: 24.9 (±4.4) kg/m²) were enrolled: 273 distinct pairs of CI measurements were analyzed. The Bland-Altman analysis revealed a bias of -0.02 L/min/m² (95%Cl, -0.05 to 0.00), a precision of 0.20 and a MPE of 14.71% (95%CI, 13.17 to 16.25). LoA were -0.41 (95%CI, -0.45 to -0.37) and 0.37 L/ min/m2 (95%CI, 0.33 to 0.41).





Conclusion(s): The VenArt® device showed good agreement with TTE, with a negligible bias and a MPE well below the 30% threshold generally considered as clinically acceptable. These findings suggest that the VenArt® device is reliable for non-invasive CI monitoring during the perioperative period in gynecological laparoscopic procedures. Further analyses need to confirm the interchangeability between these methods during other surgical procedures.

Acknowledgements: We thank the Unit of Anaesthesiological Investigations (Prof. N. Elia, F. Ennahdi, S. Mathivon) for their help.

50AP04-8

Optimizing occupational safety in paediatric anaesthesia: assessment of an additional scavenging device during inhalation induction

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Background and Goal of Study: Inhalational anaesthesia induction, particularly common in pediatric cases, poses occupational health risks due to Waste Anesthetic Gases (WAGs) exposure. Despite built-in scavenging systems and adequate room ventilation, recent measurements in a Pediatric Induction Room showed concerning levels of sevoflurane (up to 33.4 ppm, exceeding the 1-2 ppm safety standard) and N2O (up to 125 ppm, exceeding the 10-25 ppm normal range). This study aims to evaluate the effectiveness of an additional external scavenging device in reducing healthcare workers' exposure to WAGs during paediatric anaesthesia induction by comparing environmental sevoflurane and N_oO levels with and without the system.

Materials and Methods: Ethical approval was accepted from the University Bnai Zion Medical Center, Haifa, Israel.

Inclusion criteria included healthy paediatric patients scheduled for minor surgery undergoing inhalational anaesthetic induction with N₂O and sevoflurane using a face mask.

Those in Group A the technique was realized without the presence of the scavenger system; those in Group B underwent anaesthetic induction using the new scavenger system (suction device CBT280).

Twenty measurements of gas concentrations in each group were collected

Results and Discussion: The averages of Sevofluorane concentration prior using the additional scavenger system (Mean = 10.86 ±8.67) significantly exceeded the mean concentration observed subsequent to the scavenger's application (Mean = 0.18 ± 0.31) concentration. P Value = 0.004 (ppm)

The mean N₂O level was 292±55 ppm. Differed significantly from the mean concentration after the use of the Scavenger 25.75± 0.96 ppm. P Value = 0.001 (ppm).

Conclusion(s): The integration of this new scavenger system into the paediatric induction room could be an affordable and cost-effective choice to promote a safer working environment for medical staff.

Reference:

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Healthcare providers' attitudes on smartwatchbased cardiac arrest detection

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Background and Goal of Study: Out-of-hospital cardiac arrest (OHCA) is a critical and time-sensitive event, significantly contributing to global mortality. Several research groups are currently working on technologies to automatically detect OHCA, aiming to reduce delays in detecting cardiac arrests, in particular in cases of unwitnessed arrests. The implementation of this technology presents new challenges for healthcare professionals.

This study investigates the attitudes of healthcare professionals towards this technology and identifies perceived barriers.

Materials and Methods: An online survey was sent to local Emergency Medical Services (EMS) personnel in the Netherlands and to community first responders of HartslagNu (HSN). HartslagNu is a nationwide Dutch organization which includes more than 250,000 CPR-trained community volunteers.

The surveys were developed and tested in collaboration with The Dutch Association of Medical Managers Ambulance Care (NVMMA) and STAN, the technical provider from HartslagNu. The quantitative data was descriptively analyzed and a content analysis of the open-ended questions was performed.

Results and Discussion: A total of 412 participants from EMS and 1401 from HSN were included in the study. The majority of participants, 70.1% (95% CI: 65.9 - 74.9) from EMS and 94.4% (95% CI: 93.1 - 95.5) from HSN, indicated interest in the technology. Additionally, 53.6% (95% CI: 48.7 - 58.5) of EMS participants and 88.2% (95% CI: 86.3 - 89.8) of HSN participants agreed to

The most cited reason for not agreeing with the use of automated cardiac arrest detection was the fear of too many false alarms. When asked what an acceptable amount of false alarms would be out of 100 calls, the EMS group indicated 5 (IQR: 5-10) and the HSN group 5 (IQR: 5-10).

The qualitative analysis showed the importance of accuracy and reliability of the technology and a fear of too many false alarms. The analysis also showed that participants recognized the value of timely detection and the life-saving potential this technology may have.

Conclusion(s): The majority of participants have a positive attitude towards automated cardiac arrest detection and recognize the life-saving potential of this technology. However, participants emphasize the importance of the reliability of the device to minimize false alarms as much as possible.

50AP05-3

Use of CONOX monitor to guide superficial sedation during auditory evoked potentials in a 3-year-old child

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Background: During auditory evoked potential studies it is essential to achieve sedation that does not compromise neurological responses. In this context, the CONOX monitor emerges as a key

Case Report: A 3-year-old child underwent auditory evoked potential testing for the diagnosis of deafness. Sedation was initiated with CAM 1. Subsequently, the sevoflurane dose was maintained around 0.8%, adjusting it according to the qCON index readings from the CONOX monitor, aiming to reach and maintain a qCON near 70, indicative of superficial sedation. During the procedure, the patient was administered 40% oxygen via a facial mask, maintaining spontaneous ventilation without intubation. Thanks to sedation, the patient remained still and the auditory evoked potential signals were clearly recorded.

Discussion: Sedation in auditory evoked potential studies presents a special challenge. These studies require the patient to remain calm and motionless, while at the same time, it is crucial that neurological responses are not compromised by excessive sedation. The CONOX monitor, by providing real-time qCON index readings, allows healthcare professionals to rate sedation accurately and adaptively.

Sevoflurane-adjusted use according to qCON readings ensured optimal sedation, allowing the collection of high-quality auditory evoked potentials without interferences. It is noteworthy that in pediatrics, achieving adequate sedation can be even more challenging due to the variability in patient responses and lower tolerance to invasive procedures. Therefore, real-time sedation control is particularly valuable in this age group.

This experience reinforces the importance of detailed and personalized monitoring in procedures requiring sedation. While induction with CAM 1 marks the initiation of sedation, adjusting the sevoflurane dose based on the qCON index ensures continuous and adaptive sedation that meets the patient's exact needs at each moment.

Learning points: The CONOX monitor provides invaluable guidance for the precise titration of sedation, especially in delicate procedures such as auditory evoked potentials in pediatrics. Adjusting the anesthetic dose in real-time based on sedation depth optimizes the efficacy and safety of the procedure.

Efficacy of point-of-care thromboelastography (TEG) with Platelet Mapping® beyond cardiac surgery: adjustment of antiplatelet therapy in at-risk patient in ICU. A case report

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Background: Antiplatelet agents are vital for managing coronary atherosclerotic disease, especially during surgery. The choice to continue or stop therapy should be personalized, considering each patient's thrombotic and hemorrhagic risks. Research shows increased thrombotic risk for surgeries within six months after coronary stent placement, often suggesting delays when possible. The risk of severe perioperative bleeding is also important. Techniques like TEG and PlateletMapping offer insights for managing antiplatelet therapy, enabling tailored approaches. We present a case where this device allowed precise adjustments to dual antiplatelet therapy, enhancing patient outcomes.

Case Report: 57-year-old man with a history of smoking, hypertension, and dyslipidemia had angioplasty with a drug-eluting stent and was on aspirin (ASA) and clopidogrel. Three months later, he needed surgery for a 57 mm infrarenal aortic aneurysm. Endovascular treatment was chosen, continuing ASA and stopping clopidogrel the day before. The procedure went well, and TEG results allowed early reintroduction of dual antiplatelet therapy. The patient was monitored and discharged without complications.

Discussion: Patients on antiplatelet therapy in the operating room is increasing. This therapy can greatly impact intra and post-op management. Devices like the TEG6s with PlateletMapping will enable a more personalized approach to managing each patient effectively.

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Learning points: Personalizing antiplatelet therapy in the perioperative period is essential, considering the patient's thrombotic/ hemorrhagic risks.PlateletMapping, assesses platelet functionality in clinical settings, even outside the OR.



50AP05-7

Virtual reality: a teaching-learning strategy for cognitive mastery in airway trauma management

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Background and Goal of Study: As anesthesia education evolves, innovative and effective supplemental teaching methods are needed for educating medical trainees on crisis management skills. Virtual Reality (VR) offers immersive, scalable, and self-directed learning environments, but its effectiveness compared to traditional mannequin-based simulations remains underexplored for teaching complex decision-making skills such as airway trauma management.

This randomized controlled trial evaluates the efficacy of VRbased simulation versus traditional mannequin-based training in enhancing both knowledge acquisition and application of decision-making concepts for airway trauma management.

Materials and Methods: Forty medical students were randomized to either the VR (intervention) group or the Mannequin (control) group. Participants practiced airway trauma management using their assigned modality. Both groups completed a pre- and postintervention knowledge acquisition test, and a knowledge application mannequin-based crisis scenario one week later.

Results and Discussion: Both groups demonstrated significant knowledge acquisition (VR: +2.0, P=0.006; mannequin: +3.2, P<0.001). However, no differences were observed between the groups in the knowledge acquisition assessment (P=0.15). While for the knowledge application test, the Mannequin group outperformed the VR group (mean difference: 1.58, P=0.021), with faster recognition of a potential airway injury (P=0.004). Finally, the VR group reported higher engagement and satisfaction, preferring VR as a future learning modality.







Conclusion(s): VR-based training is comparable to traditional mannequin simulation for knowledge acquisition but may be less effective for practical knowledge application in critical clinical scenarios. Given the participants' excitement and satisfaction towards VR, we believe it can be incorporated into the medical curricula. Future research should focus on larger multi-site studies and improvement of the VR technology.

Evaluation of cost savings through continuous vital sign monitoring in post-surgical patients: a two-country health-economic analysis

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Background and Goal of Study: Adverse events following surgical procedures create a substantial clinical, resource and environmental burden. Intermittent monitoring in low-acuity settings such as general surgical wards can miss early detection of patient deterioration and may impede timely intervention to prevent adverse events. Continuous vital sign monitoring (CVSM) systems were developed to mitigate these complications and to enhance patient safety. While the clinical impact of CVSM is well reported, the economic impact of CVSM implementation is lacking. Here we assess the costs and consequences of CVSM in post-surgical patients from the hospital perspective in the United Kingdom (UK) and Netherlands (NED).

Materials and Methods: A structured review was conducted to extract data from published literature. A health-economic model was developed following ISPOR's guidelines to capture cost, resource use, and environmental consequences comparing CVSM to intermittent monitoring. A decision tree was used to model the care pathway for a cohort of 100 patients. Outcomes considered were total costs, presented in 2023 GBP/EUR, number of hospital days, rapid response team activations, and environmental impact (CO₂₀₀ and waste). Model uncertainty was assessed using probabilistic sensitivity analysis.

Results and Discussion: The results of the literature search showed CVSM's potential to prevent intra-hospital cardiac arrests, decrease ICU transfers, and decrease length of stay in both ICU and general wards.

However, data gaps for CVSM still exist on the individual country level. The model found that CVSM implementation costs of €436 (NED) and £342 (UK) per patient could be offset by savings in avoidable patient adverse events (Table 1). Hospital waste and carbon output was also reduced with use of CVSM.

		Netherland	ls	UK			
Outcomes	Standard of care	Continuous Monitoring	Difference (95% Credible interval)	Standard of care	Continuous Monitoring	Difference (95% Credible interval)	
Rapid response team activations (N)	4	3	1 (1.1-1.4)	37	27	11 (10-12)	
General ward length of stay (days)	410	382	28 (25-31)	772	720	52 (47-57)	
Intensive care unit length of stay (days)	21	12	9 (8-11)	14	8	5 (4-6)	
Costs (Euros, Great Britain Pound)	€321,915	€278,346	€43,569 (€35,989- €51,002)	£302,665	£268,481	£34,184 (£28,763- £39,574)	
CO ₂ equivalents (tons)	54	49	5 (4-6)	98	91	7 (6-9)	
Waste (kilograms)	1,391	1,266	125 (108-143)	2,521	2,335	186 (157-218)	

Table 1. Model results summary for Netherlands and UK on the impact of continuous monitoring for 100 patients

Conclusion(s): CVSM is expected to enhance patient safety and create savings in terms of costs and resources. Further research, particularly with real-world data, to confirm or contest these model findings are encouraged.

50AP05-10

Development and validation of a machine learning algorithm for Prediction of complete **NEuromuscular recovery in adult Surgical** patients (PINES)

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Background and goal of study: Rocuronium is the most used neuromuscular blocking agent. Despite many advantages, its duration of action varies greatly and is difficult for clinicians to predict[1].

Multiple patient- and anaesthesia-related factors are known to influence the effect of rocuronium [2, 3] and should optimally be considered for adequate dosing of neuromuscular blocking agents. We performed different machine learning model to predict the neuromuscular recovery of rocuronium prior to its administration.

Materials and Methods: Patient records from 2014/07 to 2023/01 with non-cardiac surgery, a single rocuronium dose and spontaneous neuromuscular recovery were analysed (ethical approval 2022-198-S).

A total of 101 variables were used as input for the development of our machine-learning model. The dataset was split into 80%-20% for training and validation cohorts.

Using the AutoML framework and other regression models, 12 different machine-learning algorithms were trained to predict neuromuscular recovery after rocuronium administration to a train of four-ratio >0.9

Results: A total of 25,412 records were analysed. Median age was 54 years, surgeries had a median duration of 58 minutes, and ASA II was the dominant classification (44%). A scatter plot showing observed and predicted recovery times is shown in Figure 1A. The most relevant predictors were rocuronium dose, patient age and height (Figure 1B, importance plot). The difference between observed and predicted recovery time (root mean square error (RMSE)) to a train of four-ratio of >0.9 was 20 minutes and 46 seconds of the best model and did not vary between machinelearning algorithms (Figure 1C).

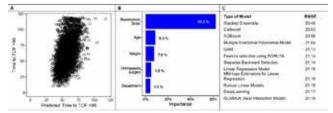


Figure 1.

Discussion: An RMSE of 20 minutes was considered clinically acceptable for predicting neuromuscular recovery. This is supported by pilot data showing that even clinicians had an average deviation of 26 minutes between predicted and observed recovery time.

Our findings confirm that dose and patient characteristics have most influence on the duration of neuromuscular blockade. The uncertainty of the prediction emphasises the importance of neuromuscular monitoring and the use of effective reversal drugs.

50AP05-11

Preliminary development of an Al-driven meta-model combining deep learning and Al-ECG for enhanced clinical deterioration prediction on general wards

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Background and Goal of Study: Despite advances in healthcare monitoring, up to 80% of unplanned ICU admissions result from undetected clinical deterioration on general wards. Continuous vital signs monitors offer a potential solution but can be prone to false alarms, generating alarm fatigue and reducing clinical effectiveness. Al-driven models address this challenge, though few are integrated into clinical workflows.

We aimed to develop a comprehensive predictive model using deep learning techniques, trained on patient-specific data (demographics, medical history and continuous vital signs), with the ultimate goal of model stacking with our 12-lead AI-ECG risk prediction model. This will provide an advanced, more holistic and accurate assessment of clinical risk deterioration.

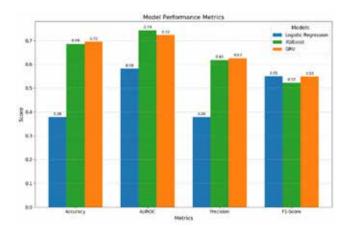
Materials and Methods: A dataset of 500 post-surgical patients from Chelsea and Westminster NHS Foundation Trust was used. Clinical deterioration was labelled as having either one of the following: sepsis, an elevated NEWS score triggering a rapid response team activation or cardiac arrest call, an unplanned ITU admission or mortality during that hospitalisation.

The dataset was stratified and a logistic regression, gradient boosted model (XGBoost) and GRU model were sequentially trained on standardised features. After hyperparameter tuning, models were validated and the highest performing selected.

Results and Discussion: Preliminary results from the trained clinical prediction models show that GRU has better overall accuracy (0.70) and F1-score (0.55) compared to the logistic regression and XGBoostmodels. Logistic regression lags significantly in AUROC (0.58) and overall performance. The GRU model appears to balance accuracy and F1-score effectively.

Conclusion(s): These preliminary results show that deep learning models significantly outperform logistic regression and gradient boosted machines, which are the current standard used in clinical prediction analytics.

Further development of a meta-model integrating the predictions from the GRU and an Al-enhanced electrocardiogram platform is planned, with the potential to enhance accuracy and robustness in clinical prediction tools.



50AP05-12 Neuromuscular monitoring, are we really doing it right?

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Background and Goal of Study: The Association of Anaesthetists (AoA) recommends quantitative neuromuscular monitoring (NM) during all phases of anaesthesia involving neuromuscular blocking (NMB) drugs. NM is initiated prior to NMB drug administration and continues until adequate recovery (Train-of-four ratio >0.9) is confirmed.

This audit aimed to assess our department's compliance with the AoA's recommendations regarding the frequency of NM, choice of nerve stimulator, and assessment of neuromuscular recovery during anaesthesia involving NMB drugs.

Materials and Methods: An anonymous questionnaire was distributed to all members of the anaesthesia department at Lister Hospital, to assess compliance with NM use during general anaesthesia with NMB drugs. The survey aimed to identify understanding of current guidelines, current practices, and organisational or practical barriers to NM use.

Results and Discussion: Of 31 respondents, 27 (87%) were aware of the AoA's NM recommendations. However, only 7 (23%) routinely used a nerve stimulator during induction, and 26 (84%) during extubation. For intubation without NM, 24 (77%) relied on 'time since administration'. Barriers to NM use for extubation included limited stimulator availability and a reliance on the assumed adequacy of NMB drug pharmacokinetics.

The majority, 25 (81%), used the Train-of-four (ToF) ratio for neuromuscular blockade assessment. Five (16%) assessed neuromuscular blockade using the ulnar nerve, while 22 (71%) used the facial nerve.

Compliance with current NM guidelines remains suboptimal. Despite a high level of awareness regarding the AoA recommendations, our audit revealed limited use of NM, particularly for intubation. While most participants utilised qualitative NM for extubation, quantitative NM was not employed at all.

Key barriers to NM adoption included limited stimulator availability and an overreliance on subjective assessments to determine adequate reversal.

To address these issues, our department has secured funding for new NM monitors and conducted a comprehensive teaching session on the importance and proper use of NM.

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Conclusion: Our audit revealed suboptimal compliance with NM guidelines. Despite awareness, reliance on subjective assessment persists. To address this, we have procured additional NM monitors and conducted training sessions. A future audit will evaluate the impact of these interventions.

Intensive Care Medicine

51AP01-1

Cutting deep: when air pressure steals the spotlight in a percutaneous tracheotomy

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Background: Percutaneous tracheotomy is a "blind" surgical procedure that can cause damage to the trachea and surrounding tissue and result in fatal complications (pneumomediastinum and tension pneumothorax).

Case Report: The patient was diagnosed with MS 25 years ago. On the day of admission, she has a feeling of new-onset dyspnea. The diagnostic work-up proved the perforation of the hollow organ, and a hemicolectomy with a terminal ileostomy was performed. After 10 days of mechanical ventilation, we decided to perform a percutaneous tracheotomy.

Since we were not sure where the guide tube ended, the inexperienced bronchoscopist confirmed that the guide tube was in the trachea when, in fact, we placed the cannula in the para-mediastinal tissue.

Complications occurred in terms of complex ventilation and ventilation with enormous resistance. An x-ray of the lungs is done. The thoracic surgeon was unsure if there was a pneumothorax, so he requested an MSCT of the thorax, after which a diagnosis of pneumomediastinum with bilateral pneumothorax was made.

The patient was hemodynamically unstable, and vasoactive support with noradrenaline and vasopressin was included. due to complicated ventilation, adrenaline was also included in intrapulmonary.

Discussion: Risk factors for tracheal injury include tracheal anatomy and the rigidity that makes the trachea vulnerable, including female gender, older age, shorter stature, COPD, and corticosteroid therapy. It most often occurs in connection with a direct injury to the trachea but can also occur without a specific tracheal injury. The cause of tension pneumothorax can be classified into two types: direct tracheal injury and false lumen passage without definite tracheal injury.

To compensate for hypoxia, significantly ventilated air creates a large amount of pneumomediastinum through the injury of the trachea, then spreads to the subcutaneous tissue, mediastinum, pleura, neck and thorax, actually through the weakest points of the tissue.

Learning Points: Percutaneous tracheotomy can have fatal complications like bilateral tension pneumothorax, and despite a delayed diagnosis after bilateral thoracocentesis, this patient survived.

51AP01-2

Biomarkers of bacterial translocation and intestinal wall damage in patients with multiple organ dysfunction syndrome

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Background and Goal of Study: The aim of this study was to evaluate the potential biomarkers of bacterial translocation: lipopolysaccharide-binding protein (LBP), soluble CD14 subtype (sCD14-ST), and intestinal wall damage: intestinal fatty acid binding protein (I-FABP), Zonulin, regenerating islet-derived protein- 3α (REG3 α), in the patients with multiple organ dysfunction syndrome (MODS).

Materials and Methods: The study involved 327 patients divided into 2 groups: Group 1 - 227 patients with MODS (main group), Group 2 - 100 patients without MODS with identical pathologies (control group). MODS was diagnosed according to the SOFA scale, and mortality prediction scores APACHE II was also assessed.

To determine biomarkers, venous blood was taken in the control group on the day of admission, and in patients with MODS when detecting signs of MODS, on the 3rd and on the 7th day of its development. Markers were determined by the ELISA method according to the manufacturer's instructions.

Results and Discussion: The control and main groups did not differ in age, sex, main pathology and comorbidities (p=0.133, p=0.672, p=0.582 and p=0.441, respectively). In the control group, the values of all the studied markers were significantly lower than in the main group (p<0.0001). In the main group mortality rate was 44.9% (n=102).

Deceased patients with MODS had significantly higher sCD14-ST level on day 1, I-FABP and REG3 α levels on days 1 and 3 (p=0.043, p=0.004, p=0.018, p=0.010 and p=0.049, respectively). The LBP level on the day 7 was lower in deceased patients (p=0.006). The threshold values of the studied markers, at which the risk of death in patients with MODS increases, were determined.

Conclusion(s): In patients with MODS, increased I-FABP, REG3a, sCD14-ST levels and decreased LBP level may indicate increased intestinal wall permeability and bacterial translocation, which may worsen the course of multiple organ dysfunction and increase the risk of death.

Despite the limitations of this study, the studied potential biomarkers of intestinal wall damage and bacterial translocation are interesting candidates for identifying patients with a high risk of mortality to revise the tactics of therapy in order to reduce the stay of patients in the intensive care unit and lower mortality rate.

Acknowledgements: This research is funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan [Grant No. AP19677271].

51AP01-3

To salt or sweeten? Management dilemma in concomitant diabetic ketoacidosis and central diabetes insipidus

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Background: Managing concomitant diabetic ketoacidosis (DKA) and central diabetes insipidus (DI) is extremely challenging. First. DKA with fluid deficit masks underlying central DI. Second, the choice of resuscitation fluids directly influences serum sodium which can result in severe life-threatening complications. Fluid resuscitation with isotonic fluids in DKA can worsen hypernatremia, yet using hypotonic fluids may rapidly lower serum osmolarity causing cerebral oedema.

Case Report: A 33-year-old female was admitted to the Intensive Care Unit with severe DKA. She presented with altered mental status and vomiting with severe metabolic acidosis. She was initially resuscitated with 2.5L intravenous plasmalyte. She was later diagnosed with a large pituitary neuroendocrine macroadenoma for which she underwent an urgent transsphenoidal excision and later developed central DI.

Urgent consultation was made with Endocrinology. Due to hypernatremia, the patient was first started on dextrose 5% intravenous fluid 83mL/hr with free water boluses 600mL/day via an orogastric tube.

However, she developed significant hyperglycemia despite being on IV insulin infusion. She was switched to intravenous 0.45% normal saline infusion at 83mL/hr where her serum sodium was closely monitored with subsequent clinical improvement.

Discussion: When in fluid deficit, severe DKA will mask underlying DI due to low urine output, thus providing a diagnostic dilemma¹. In DKA, the preferred resuscitation fluid is an isotonic fluid. However, this is dangerous in patients with DI as it causes precipitous increases in serum sodium.

The preferred intravenous fluid of dextrose 5% in patients with DI also worsens hyperglycemia in DKA. As it is extremely rare to have concomitant DKA and DI, there are few available case reports. It is pertinent to accurately diagnose and carefully resuscitate these patients to prevent life-threatening complications.

References:

1. Gonzalez E et al. Central Diabetes Insipidus Masked by Uncontrolled Diabetes Mellitus: A Challenging Case Managed With Indapamide. Cureus. 2022 Feb 4;14(2):e21897. doi: 10.7759/ cureus.21897. PMID: 35265423; PMCID: PMC8898342

Learning Points: No guidelines exist for managing concomitant DKA and DI. Polyuria and persistent hypernatremia in a patient with DKA should raise the suspicion for DI. Choice of fluid resuscitation must also be carefully deliberated to balance the risks of worsening hypernatremia with decreasing osmolarity rapidly.

51AP01-4

The Role of Point of Care Ultrasound (POCUS) guided rescue thrombolysis in the management of postpartum pulmonary embolism with cardiac arrest in secondary care setting - the road between scylla and charybdis

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Background: Pulmonary embolism (PE) is a life-threatening condition that significantly affects postpartum women due to the hypercoagulable state. PE-induced cardiac arrest (CA) has a mortality rate of about 65% (1).

This case report highlights the importance of early thrombolytic therapy, Point of care Ultrasound (POCUS), and management of severe bleeding and hemorrhagic shock after thrombolysis.

Case Report: A 28-year-old woman, G1P1, who had undergone an emergency C-section due to early placenta abruption and rupture of the uterus with smooth recovery, presented on postoperative day one with sudden dyspnea and hemodynamic instability.

This was shortly followed by a witnessed sudden CA, prompting immediate Cardiopulmonary resuscitation (CPR). Urgent POCUS revealed right ventricular dysfunction consistent with acute PE. Due to the lack of availability for emergent catheter-directed local thrombolysis, the decision was made to proceed with systemic thrombolytic therapy despite the high risk of bleeding.

The patient received the recommended thrombolytic therapy using Alteplase, After About 60 minutes of Prolonged CPR, ROSC was achieved, and the patient was transferred to the Intensive Care unit

A detailed transthoracic echocardiogram confirmed the diagnosis of PE, showing an enlarged right ventricle, D-sign, distended inferior vena cava and a TAPSE of about 11 mm. As expected, the patient suffered significant bleeding complications, requiring massive blood products and clotting factors transfusion.

After several hours of controlling the bleeding, the patient's condition stabilized. A CT angiogram confirmed a massive PE. The patient developed multiorgan dysfunction that required critical care management, including renal replacement therapy and liver support, the patient recovered fully without neurological sequelae and was discharged home after 20 days.

Discussion: Thrombolytic therapy during CA due to PE has been increasingly reported, with several studies showing improved outcomes compared to conventional CPR alone (2).

Studies have shown that applying POCUS during CPR aids in rapidly diagnosing the underlying causes, enabling targeted treatment (3).

References:

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- 2. https://doi.org/10.2147/oaem.s275767,
- 3.https://doi.org/10.3390/diagnostics14040434

Learning Points: The high suspicion index and POCUS use in the setting of sudden CA can be life-saving in such highly complicated cases. Expect the unexpected.

51AP01-5

Paradoxical embolism: a rare culprit in an unexpected clinical presentation

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Background: Patent foramen ovale(PFO) is a congenital disease that is often seen in adults. Patients are usually asymptomatic and are noticed during etiological investigation of paradoxical embolism. When etiology of stroke is investigated in patients younger than 60 years of age, atrioventricular septal defect (ASD) and (PFO) should be considered when cause is not found.

In our case, we aimed to discuss a patient who was diagnosed with deep vein thrombosis (DVT) and came to emergency service with respiratory distress and seizure.

Case Report: A 52 years old male has hepatit B,asthma and epilepsy. Patient was diagnosed with DVT in lower extremity, 3 weeks after meniscus operation and was discharged home after treatment adjustment. Patient who had no history of seizure for 5 years had seizure on the way home and was brought to emergency room with loss of consciousness and respiratory distress. No acute changes were detected in the patient's brain computer tomography (CT).

Filling defects were detected in the patient's pulmonary artery CT angiography and embolism could not be excluded. Patient had sinus tachycardia and hypertension in the ICU follow-up, but respiratory parameters were normal. Patient who had no neurological defects, had a severe headache resistant to analgesics and continued nausea.

Control brain CT revealed acute ischemia in both cerebellar hemispheres, left occipital and parietal lobes. In addition "intraparenchymal hematoma area in left temporal lobe" was observed. It was consistent with the diffusion MR and CT taken on same day. Echocardiogram (ECHO) was planned for the patient with suspicion of paradoxical embolism and suspicious atrial transition was observed during ECHO. Transesophageal echocardiography was performed for further evaluation and PFO was detected; PFO closure was performed on the same session.

Discussion: Patients who have embolic stroke without obvious cause, PASCAL (PFO-Associated Stroke Causal Likelihood) classification system, which also includes RoPE score (Paradoxical Embolism Risk) is used. Our patient's RoPE score was 7, according to PASCAL, probability of cerebrovascular disease (CVD) being associated with PFO in our patient was high. Coexistance of DVT and syncope should suggest paradoxical embolism, if neurological examination is normal.

References:

- 1. Elgendy AY et al, JAMA Neurol 2020;77:878
- 2. Kent DM et al. Neurology 2013;81:619
- 3. Kent DM et al. The SCOPE Study 2023 Apr

Learning Points: Paradoxical embolism, PFO, Syncope

51AP01-7

Unveiling diaphragmatic rupture: intensive care management in a late diagnosed case

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Background: Diaphragmatic rupture (DR) can result from thoraco-abdominal traumas (TAT)¹. Chest X-Rays may fail in diagnosing, because air-containing abdominal organs in thorax can be misinterpreted and confused with other diagnosis like pneumothorax (PX)¹⁻³.

Most specific radiographic signs are herniated organs or nasogastric tube (NG) in thorax³.

Case Report: 24-year-old male admitted after TAT. During his stay, respiratory distress occured, PX was suspected, and chest tube was placed (Fig.1a).

Respiratory distress persisted. More imagings performed, revealing a defect in diaphragm, and a herniated stomach (Fig.1b-c).

Surgery for reduction and repair was perfomed. Patient was admitted to ICU. Intolerance to enteral feeding developed. Intra-abdominal (IA) pressure, along with infectios parameters, increased. CT showed contamination, promting laparatomy. Necrotic and perforated ileum resected. Ileostomy was performed.

Septic shock due to IA sepsis developed. Cytokine-filtered continue renal replacement therapy and neuromuscular electrostimulation therapy to diaphragm applied. Diaphragm thickness fractions calculated and extubated accordingly, then discharged on 42nd day.







1 a) Chest X-Rays interpreted pneumothorax and thorax tube inserted





1 b) Upright abdominal X-Rays









(c) CT scan revealing herniated stomach

Figure 1: Chest and abdominal X-Rays and CT scan

Discussion: When evaluating DR, misdiagnosis and consequential damage can occur³.

Placing NG is helpful in confirming the diagnosis, and preventing further herniation^{1,4}.

In this case our belief is, ileal perforation, may have been occured during chest tube insertion, or due to possible necrosis while in thorax.

References:

- 1. Lee, K., et al., Diaphragm Injury, in StatPearls. 2023, StatPearls Publishing.
- 2. Simon, L.V., et al., Diaphragm rupture. 2017.
- 3. Nieto, I.P., et al., Gastric incarceration and perforation following posttraumatic diaphragmatic hernia. Acta Chirurgica Belgica, 2001. 101(2): p.81-83.
- 4. Goh, B.K., et al., Delayed presentation of a patient with a ruptured diaphragm complicated by gastric incarceration and perforation after apparently minor blunt trauma. Canadian Journal of Emergency Medicine, 2004. 6(4): p.277-280.

Learning Points: After TAT, DR and herniation must be considered. Differential diagnosis must be evaluated, and interventions should be performed accordingly.

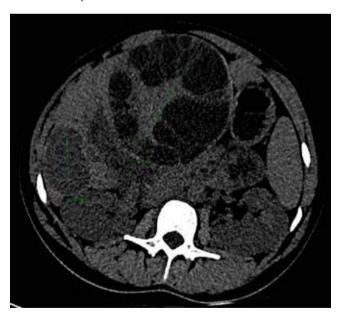
51AP01-8

A severe refractory cardiogenic septic shock as a result of the echinococcus infection

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Background: Human echinococcosis is a parasitic disease caused by tapeworms of the genus Echinococcus. Human infection with echinococcosis leads to the development of one or more cystic structures in different organs. A cyst damage can lead to a potentially life-threatening infection.

Case Report: A 28-year-old female with a medical background of liver Echinococcosis, Gastritis, and Smoker was admitted to the hospital due to a fever and possible cyst infection after she decided to stop the treatment with Albendazole.



Discussion: The abdominal CT showed echinococcal cysts in the liver with significant pressure on the stomach and duodenum, suggesting a rupture in the larger cyst due to inflammation or infection. The patient was treated with Albendazole, Rocephin, and Metronidazole for possible secondary infection and discharged to continue treatment, with elective surgery scheduled in one month. Eight days later, she was rehospitalized for abdominal pain and underwent exploratory laparotomy with partial hepatectomy and PAIR for cysts in segments 4B, 6, and 7. The surgery was successful, but by day 6, her condition worsened, showing signs of multiple organ failure: hemodynamic instability, acute respiratory and renal failure. She was transferred to the ICU, intubated, and started on inotropic support. ECHO revealed poor ventricular contraction (EF 20%). Lab results showed acute inflammation (WBC 38.1, CRP 29.9, Procalcitonin 34.1). Diagnosed with refractory cardiogenic shock and septic cardiomyopathy, she was placed on VA-ECMO and CRRT.

After 5 days, her heart function improved (EF 55%), and renal function was restored. Antibiotics were adjusted based on blood cultures, and after 9 days, she was extubated, transferred to the surgical ward, and later discharged home in good condition, continuing treatment with Praziquantel and Albendazole.

References:

https://www.who.int/news-room/fact-sheets/detail/ echinococcosis

Learning Points: This clinical case demonstrates that timely started ECMO has been used successfully for the treatment of patients with severe refractory cardiogenic shock caused by Echinococcus sepsis in the early postoperative period.

51AP01-9

A fulminant immune hemolytic anemia induced by contrast medium was successfully treated with eculizumab

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Background: Contrast media (CM) is frequently associated with allergic reaction and kidney dysfunction. It can, however, also induce hemolytic anemia with a broad spectrum of hemolytic manifestation.

Case Report: We report of a 38-year-old male patient with a life-threatening intravascular immune hemolytic anemia after application of lomeprol due to a CT scan of thorax/abdomen. In our report, we illustrate the diagnostics and treatment of a lifethreatening hemolytic anemia induced by contrast medium that was successfully treated with eculizumab, a recombinant humanized monoclonal antibody used to treat paroxysmal nocturnal hemoglobinuria, and atypical hemolytic uremic syndrome among others.

Discussion: In literature, four case reports of CM-induced hemolysis of varying degree can be found [1-4]. We were confronted with a massive life-threatening intravascular hemolysis. To our knowledge, no drug-induced hemolysis with this magnitude and successful therapy has been published. Before knowing the serological findings, we chose a double-barreled therapy with eculizumab as the patient's critical condition didn't allow any delay of therapy. Four weeks later, the patient could be transferred to a rehabilitation unit and was back into full employment after one year.

References:

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- 2. Maurin C et al.: Immune hemolysis secondary to injection of contrast medium. Transfusion 2018, 58(9):2113-2114.
- 3. Mayer B et al.: Intravascular immune hemolysis caused by the contrast medium iomeprol. Transfusion 2013, 53(10):2141-2144.
- 4. Nordhagen R et al.: Immune-mediated hemolysis associated with the administration of a radiographic contrast medium. Transfusion 1991, 31(9):843-846.



Fig. 1: Skin efflorescences of hemolysis from a comparable case.

Learning Points: There are different mechanisms and serological findings underlying immune hemolytic anemia.

Beside eculizumab, plasma exchange/plasmapheresis, steroids, immunosuppression, and i.v. immunoglobulins are therapeutic options.

51AP01-10

Thyrotoxicosis induced coronary vasospasm as a rare cause of cardiorespiratory collaps: case report

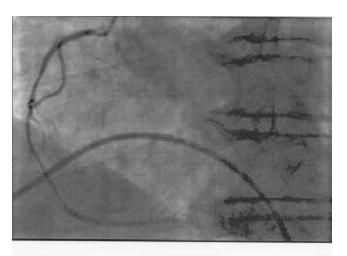
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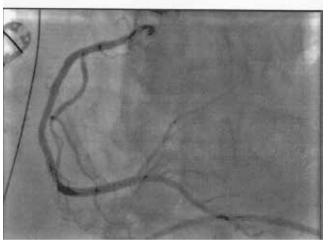
Background: Cardiac complications in patients with thyrotoxicosis are rather common and varied, including atrial fibrillation, heart failure or myocardial ischemia due to coronary spasm, but severe complications resulting in cardiac arrest are rare.

Case Report: We present a case of cardiac arrest in a 63 years old male with severe coronary vasospasm of the right coronary artery due to thyrotoxicosis. Diagnosis was made after coronarography and laboratory tests. The coronarography showed a severe spasm of the right coronary artery resolving after nitrate administration.

The patient fully recovered after treatment with intravenous nitrates and thyrostatic agents. Before discharge an internal defibrillator was implanted.

Discussion: To the best of our knowledge, this is the first case of cardiac arrest due to coronary vasospasm in a patient with thyrotoxicosis. Several cases in recent literature describes cardiac arrest in patient with profound heart failure due to thyrotoxicosis, but none of the case reports with coronary vasospasms results in cardiorespiratory collaps. In this case, the patient's cardiac function remained intact.





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Learning Points: When a patient presents with coronary vasospasm, it is crucial to consider a hyperthyroid state, whether it presents as subclinical recurring angina or as severe cardiac arrest, as in our case. Only through a correct diagnosis, a rapid and targeted therapy with thyrostatic agents be initiated to resolve the recurring vasospasm.

A case of using mesenchymal stem cells in a patient with post-intensive care syndrome

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Background: Regenerative medicine today offers innovative approaches to treating diseases using cellular technologies [1]. Cellular therapy, through various mechanisms including mitochondrial transfer, represents a new frontier in managing patients with high risks of comorbidity, including those associated with neurological status. Mesenchymal stem cells (MSCs) possess great potential due to their ability to self-renew, differentiate into tissue-specific cells, and their significant immunomodulatory and anti-inflammatory properties.

Case Report: Patient A., a 65-year-old person underwent orthotopic liver transplantation. The postoperative period was complicated by infectious complications, the development of septic shock, and multiple organ dysfunction syndrome. We were dealing with a patient who had multiple severe systemic disorders, including neurological (hemorrhagic brain infarction), infectious, and organ-related complications, including impaired liver graft function. The duration and intensity of the treatment contributed to the development of post-intensive care syndrome [2].

Neurological rehabilitation, physiotherapy, and the maintenance of adequate nutritional and metabolic status did not yield significant improvements. Therefore, on the 30th, 32nd, and 34th days of intensive care, mesenchymal stem cells were administered intravenously at a dose of 4 million units per kilogram. Seven days after the transplantation of stem cells, alongside nutritional and metabolic correction, the patient demonstrated improvement in physical, cognitive, and psychological well-being. By the 57th day of hospitalization, the patient was discharged in satisfactory condition to continue treatment on an outpatient basis.

Discussion: The practical use of mesenchymal stem cells shows significant potential in clinical applications, demonstrating the ability to improve clinical outcomes in patients with neurological deficits.

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Learning Points: The transplantation of mesenchymal stem cells represents a promising new treatment approach. The precise mechanisms by which mesenchymal stem cell therapy promotes recovery require further investigation.

51AP01-12

The herald bleed: a severe complication secondary to an aortoenteric fistula

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Background: Aortoenteric fistula (AEF) is a rare but life-threatening condition that can result from a variety of causes although abdominal aortic aneurysm is the most common risk factor. The diagnosis can be challenging, and it usually requires urgent and aggressive treatment.

Case report: A 63-year-old male with a history of hypertension, type 2 diabetes, former smoker and mycotic aneurysm of the infrarenal aorta first treated in 2022 with an endograft and then, with an aorto-aortic bypass due to the graft's infection.

He presented with upper gastrointestinal bleeding associated with hemodynamic instability, so an urgent gastroscopy revealed a pulsatile lesion in the third and fourth portions of duodenum, elevated but without active bleeding. Suspecting an aneurysm, an CT angiography was conducted, demonstrating intimate contact between the aorto-aortic bypass and the posterior wall of the duodenum.

The patient's condition rapidly worsened, developing refractory hemorrhagic shock and pulseless ventricular tachycardia so cardiopulmonary resuscitation as well as the insertion of a distal intra-aortic balloon pump were performed which enabled radiological definitive treatment: the placement of a prosthesis in the left common iliac artery due to significant contrast extravasation in the ileum.

However, the patient decompensated once again, necessitating urgent reintervention via laparotomy but it was impossible to reach the source of bleeding. The patient deceased a few hours later due to refractory hemorrhagic shock and multiple organ failure.

Discussion: AEFs can be classified in primary, mostly due to aneurysm and in secondary, more common but nevertheless rare (less than 2%), following any aortic reconstruction, especially grafts.

There is a variety of clinical manifestations, but it must be kept in mind as a potential cause of massive gastrointestinal bleeding in patients with prior aortic interventions, no matter how long since it (herald bleed).

Resuscitative Endovascular Balloon Occlusion of the Aorta (RE-BOA) has been proposed as a method to control aortic hemorrhage, providing a temporary window for resuscitation or a bridge to definitive care.

Learning points: AEF is rare but potentially lethal.

Its diagnosis relies on a high index of suspicion.

It must be kept in mind in any patient with known aortic aneurysm or prior intervention and gastrointestinal bleeding.

Without treatment, AEF is nearly uniformly fatal.

51AP02-1 Use of intravenous Vitamin K in rodenticide poisoning

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Background: Management of bromadiolone poisoning complicated by hemorrhagic shock with vitamin K.

Case Report: A previously well 19-year-old female presented with hypotension, 4 days of abdominal pain, 1 day of hematuria. She had extensive laboratory abnormalities (Table) that normalised with addition of control plasma suggesting underlying coagulation factor deficiency.

Factor assays revealed a warfarin-like effect - markedly reduced serum levels of Factors II (prothombin), VII, IX, X. Liver function was unremarkable. CT of the abdomen and pelvis showed extensive hemoperitoneum with bleeding from a ruptured left ovarian corpus luteal cyst. Coagulopathy was managed with replacement therapy guided by ROTEM by administering 6 units of packed red cells, 5 units of fresh frozen plasma, 1 unit of pooled platelets, 10 units of cryoprecipitate and IV tranexamic acid 1g 8 hourly. IV vitamin K 10mg was started 8 hourly.

An emergency laparoscopic cystectomy done after coagulopathy correction confirmed a ruptured corpus luteal cyst with 3L of hemoperitoneum. IV vitamin K was switched to oral vitamin K 30mg thrice daily postoperatively. She was discharged well after 13 days. Serum toxicology confirmed bromadiolone poisoning.

Discussion: Bromadiolone, a 2nd generation 4-hydroxycoumarin rodenticide, follows a 2-compartment model elimination kinetics with a rapid decline phase (t/12 3.5 days) and slower termination phase (t1/2 24 days)1. Treatment mainstay is vitamin K. While vitamin K can rapidly correct coagulopathy, premature termination may result in a return of clotting derangements. There are currently no guidelines for duration of vitamin K therapy. Serial measurement of coagulation function is recommended even post vitamin K cessation.

References:

1. Lo VM, Ching CK, Chan AY, Mak TW. Bromadiolone toxicokinetics: diagnosis and treatment implications. Clin Toxicol (Phila). 2008;46:703-10.

Learning Points: Bromadiolone poisoning should be suspected in patients with disproportionately extensive coagulopathy with normal levels of platelets and unremarkable liver enzymes and confirmed with toxicology. Its prolonged half-life warrants extended vitamin K duration with coagulation profile monitoring for possible coagulopathy resurgence after correction of initial coagulopathy.

Full blood count	Hemoglobin (g/dL) 4.7 (12.0-16.0) Hematocrit (%) 13.5 (36-46) Platelets (109/L) 200 (140-400)
Coagulation screen	Prothrombin time (s) > 120 (9.6-11.9) Activated partial thromboplastin time (s) 109.4 (24.4-35.2) Fibrinogen (g/L) 2.63 (2.06-4.92)
Mixing studies	Prothrombin time, 50% correction (s) 12.4 Activated partial thromboplastin time, 50% correction (s) 109.4
Factor Assay	Prothrombin (%) 3 (80-160) Factor V (%) 47 (70-170) Factor VII (%) <1 (40-180) Factor VIII (%) 211 (55-200) Factor IX (%) <1 (40-200) Factor X (%) 2 (60-160) Factor XI (%) 65 (70-200) Factor XII (%) 21 (30-200)

51AP02-2

Thirst gone too far: symptomatic hyponatremia due to water intoxication - a case report

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Background: Hyponatremia is defined as a serum sodium <135 mEg/L, is severe at levels <125 mEg/L. Dilutional hyponatremia occurs when excessive water intake overwhelms renal excretion capacity. Water intoxication is a rare cause, typically seen in specific scenarios. This report highlights a rare case of severe hyponatremia due to excessive water intake during exercise/endurance training.

Case Report: A 40-year-old male presented with acute confusion after drinking 10 litres of water over 4 hours post-exercise. He was vitally stable (GCS 13/15) with unremarkable systemic examination. Investigations showed severe hyponatremia (serum sodium 112 mmol/L), hypo-osmolarity (235 mOsm/kg), and dilute urine (urine sodium <10 mmol/L, osmolarity 117 mOsm/kg). Imaging studies, including chest X-ray and brain CT, were normal. The patient was admitted to the ICU, where sodium levels were corrected gradually with 200 mL of 3% hypertonic saline. Sodium was monitored every 4 hours, and water restriction with isotonic fluids was implemented. His sodium improved to 133 mmol/L, and he was discharged in stable condition.

Discussion: Hyponatremia is a common electrolyte disorder. Several reports have documented cases of hyponatremia in psychiatric patients or with underlying co-morbidities, but it rarely occurs in healthy individuals without underlying comorbidities^{1,2}. The kidneys are capable of excreting up to 28 litres/day, but can only excrete 0.8-1.0 litres/hour, making rapid water intake dangerous. Symptoms of severe hyponatremia range from headache, confusion, nausea, and vomiting to seizures, coma, and death in severe cases. Diagnosis requires serum osmolarity, urine osmolarity, and urinary sodium tests. Guidelines recommend infusing 150 mL of 3% saline over 20 minutes or until symptoms resolve, with a sodium correction limit of 10 mmol/L in 24 hours to avoid osmotic demyelination syndrome3.

- 1. Clinical characteristics and outcomes of hyponatremia associated with oral water intake in adults: a systematic review. BMJ open. 2021 Dec
- 2. Severe hyponatremia due to surreptitious water intoxication in a hospitalized patient. CEN Case Reports. 2023 May.
- 3. Clinical practice guideline on diagnosis and treatment of hyponatremia. Eur J Endocrinol. 2014

Learning Points:

- 1. Early recognition and appropriate management of hyponatremia is critical to prevent complications.
- 2. Fluid intake should be limited to 1-1.5 litres/hour during heavy sweating to avoid water intoxication.

51AP02-3

External transcutaneous pacemaker in cardiogenic shock caused by 2nd degree mobitz II AV block – case report

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Background: Cardiogenic shock caused by severe bradycardia, such as in the 2nd degree type 2 and the 3rd degree AV block, represents a medical emergency where immediate intervention with a pacemaker is crucial. In the absence of an implantable pacemaker, the external defibrillator's pacemaker module can serve as a life-saving alternative [1].

Case Report: A 65-year-old woman with stage 5 CKD was admitted to the ICU following acute cardiac and respiratory failure during a colonoscopy. Initial clinical findings included a BP of 60/40 mmHg, heart rate of 30-42 bpm, SpO2 at 50%, and respiratory rate of 45/min. Emergency intubation and mechanical ventilation were initiated, alongside norepinephrine at 0.3 mcg/kg/min. Arterial blood gas analysis revealed metabolic acidosis (pH 7.30, lactate 3.6 mmol/L), severe hypoxia (DO2=206 ml/min, VO2=56.1 ml/min), and pulmonary edema on chest X-ray. ECG identified a second-degree AV block type 2 (Mobitz II). Transthoracic echocardiography showed severe pulmonary hypertension, preserved left ventricular (LV) contractile function (EF=61%), and significant tricuspid and mitral valve regurgitation. Advanced hemodynamic monitoring using PiCCO revealed high preload (GEDI=1330 ml/ m²), reduced cardiac contractility (GEF=13%, CFI=2.7), and elevated extravascular lung water (ELWI=19 ml/kg). Pulmonary CT angiography excluded pulmonary thromboembolism. Diagnosis of cardiogenic shock was established.

An external transcutaneous cardiac pacemaker was set in demand mode at 90 bpm, leading to significant hemodynamic improvement (HR 90 bpm, BP 105/64 mmHg).

Over subsequent days, external pacing combined with intensive care led to clinical improvement, resolution of vasopressor dependence, and successful ventilator weaning.

Discussion: This case demonstrates the efficacy of an external transcutaneous pacemaker in managing cardiogenic shock due to Mobitz II AV block, stabilizing cardiac function and facilitating discussions for implantable pacemaker placement.

References:

1. Wung SF. Bradyarrhythmias: Clinical Presentation, Diagnosis, and Management. *Crit Care Nurs Clin North Am.* 2016;28(3):297-308. doi:10.1016/j.cnc.2016.04.003

Learning Points: External defibrillator pacemaker modules can be critical in managing severe bradyarrhythmias in ICU settings, providing a bridge to more definitive treatments.

51AP02-5

Use of 2b/3a inhibitors in patients with stroke due to internal carotid artery oclusion

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Background and Goal of Study: When performing thromboextraction in patients with ischemic stroke (IS) caused by thrombosis of the internal carotid artery (ICA), there is periodically a need for emergency endoprosthetics of the ICA, one of the complications is rethrombosis in the stent. The use of thrombolytic therapy alone does not solve the problem.

Objective: to evaluate the efficacy and safety of 2b/3a inhibitors (Aggrastat) in patients with IS in the therapeutic window for emergency ICA stenting.

Materials and Methods: A retrospective analysis was performed, which included 10 patients with IS with ICA occlusion. The average age was 59.6 years (48 – 74). Severity of the condition: Rankin 4-5 points, NIHSS 10-18, ASPECT 7-10. Before stenting, i.v. administration of Aggrastat was started at a dose of 50% of the cardiac dose, without bolus.

The duration of infusion was 18-24 hours. After stopping the Aggrastat infusion, patients immediately received loading doses of antiplatelet agents (50% of the cardiological dose): clopidogrel 300 mg, aspirin 150 mg, followed by a transition to dual antiplatelet therapy (Aspirin 100 mg/day indefinitely + Clopidogrel 75 mg/day for 3 months). All patients underwent ultrasound of the brachiocephalic arteries upon admission to the intensive care unit after reperfusion.

Evaluation of effectiveness: CT dynamics 12 and 24 hours after stenting, assessment according to Rankin and NIHSS scales after 24-48 hours.

Results and Discussion: According to CT data, a formed ischemic zone, remote hemorrhagic transformation and positive dynamics in the neurological status - 6 patients; a formed ischemic zone, hemorrhagic transformation and no dynamics in the neurological status - 1 patient; a formed ischemic zone, hemorrhagic transformation and negative dynamics in the neurological status - 2 patients. The Rankin scale score is 3-4 points, NIHSS 6-12 points. The mortality rate was 2 patients (20%).

Conclusion: The use of 2b/3a inhibitors is acceptable for emergency ICA stenting in patients with acute ischemic stroke. The use of Aggrastat is safe and effective, including in combination with systemic thrombolytic drugs.

After discontinuation of Aggrastat infusion, it is safe to switch to dual antiplatelet therapy by administering 50% of the cardiac loading dose.

Acknowledgements: To the staff of the Department of Anesthesiology and Intensive Care No. 2 of the I.S. Berzon Krasnoyarsk Interdistrict Clinical Hospital No. 20.

51AP02-6

The silent attack by streptococcus pyogenes by an unusual route

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Background: Peritonitis, often secondary to abdominal organ perforation, can rarely manifest as primary peritonitis without a clear source. This uncommon condition may rapidly progress to septic shock, requiring timely diagnosis and management.

Case Report: A 32-year-old woman presented with left iliac fossa pain, peritoneal irritation, neutrophilia and elevated lactate. Gynecological ultrasound ruled out significant findings, but CT revealed pelvic free fluid and a subacute splenic laceration. Due to clinical deterioration, exploratory laparoscopy revealed purulent fluid without an clear infectious focus. A prophylactic appendectomy was performed.

The patient developed severe septic shock requiring ICU admission, intubation, and hemodynamic support with norepinephrine and vasopressin. Initial antibiotics included ceftriaxone, metronidazole, linezolid, and doxycycline. Streptococcus pyogenes isolated from blood cultures prompted a switch to penicillin, clindamycin, and metronidazole, supplemented with immunoglobulin (2g/kg). Detection of ESBL-producing E. coli in bronchial aspirates led to escalation to ertapenem and clindamycin. The patient improved, achieving extubation by postoperative day 8, ICU transfer on day 13, and full recovery with discharge on day 18.

Discussion: Primary peritonitis due to S. pyogenes is extremely rare but highly lethal, often linked to pharyngitis or genitourinary inoculation. In this case, menstrual cup use and household contact with streptococcal pharyngitis were likely predisposing factors, resulting in advice to avoid menstrual cups post-discharge. Management of streptoccocal toxic shock syndrome involved resuscitation, vasopressor support, and targeted antibiotics.

Clindamycin or linezolid is recommended for their anti-toxin properties, with immunoglobulin added in refractory cases despite limited evidence. Peritoneal lavage and drainage were crucial to reduce bacterial load.

Learning Points:

- 1. Primary peritonitis should be considered in cases without a clear source.
- 2. Rapid microbiological diagnosis enables tailored antibiotic ther-
- 3. Multidrug resistance requires careful antimicrobial regimen se-
- 4. Intensive care and addressing risk factors are essential for recovery.
- 5. Multidisciplinary collaboration ensures optimal management of complex infections.

References:

Sumiyama F et al. Peritonitis caused by group A streptococcus: A case report and literature review. Int J Surg Case Rep. 2022;92:106839.

51AP02-7

Unveiling the shadows: candida glabrata-driven endophthalmitis and its clinical dilemma

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Background: Bilateral endogenous endophthalmitis is a rare but severe vision-threatening entity. Candida species are the most common causes of endogenous endophthalmitis, particularly in immunocompromised individuals, those with uncontrolled diabetes mellitus or intravenous drug use. Timely diagnosis and therapy are crucial to improve visual outcomes. In this case report, we aimed to discuss a patient with bilateral visual impairment caused

Case Report: A 47-year-old female patient with a history of diabetes mellitus(DM) and hypertension presented to the hospital with a complaint of bilateral visual impairment. In the last 2 weeks, she was diagnosed with urinary tract infection and vaginitis.

Candida Glabrata was isolated from both the vaginal and blood cultures. No microbial growth was observed in the anterior chamber specimen of the patient, however gram-positive cocci were seen.

Antibiotic treatment with a combination of meropenem, vancomycin and fluconazole was initiated. Intravitreal voriconazole and amphotericin-B was also administered by the ophthalmologist. In order to identify the source of infection, with a known history of vaginitis, abdominal computed tomography (CT) was performed and intra-abdominal abscess was detected. Transthoracic Echocardiography (TTE) performed after candida glabrata growth in blood culture, revealed valvular vegetations. The patient underwent both abscess drainage and atriotomy operation.

Discussion: Predisposing conditions like diabetes, sepsis, immunosuppression or trauma are the probable causes of bilateral endophthalmitis. In patients presenting with bilateral endophthalmitis, eye trauma should be investigated, a focus scan to detect infection site should be conducted, and fundus examination, abdominal CT, TEE should be strongly considered. It should be taken into consideration that the patient may have systemic candidiasis, especially if there is a predisposing factor.

References:

Sallam, Ahmed, et al. "Endogenous candida endophthalmitis." Expert review of anti-infective therapy 4.4(2006):675-685.

Yamamoto, Shinya, et al. "Bilateral Candida endophthalmitis accompanying Candida lusitaniae bloodstream infection: a case report." Journal of Infection and Chemotherapy 24.2 (2018):147-149.

Learning Points: In patients with bilateral endophthalmitis caused by candida, it should be taken into consideration that the patient may have systemic candidiasis, especially if there is a predisposing factor like DM.

51AP02-9

The diagnostic accuracy of the right ventricular outflow tract velocity-time integral in assessing fluid responsiveness with the passive leg-raising

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Background and Goal of Study: Excessive fluid administration is harmful during patient resuscitation, making fluid responsiveness tests essential [1,2]. Passive leg raising (PLR) is well-established for assessing fluid responsiveness by measuring the left ventricular outflow tract velocity-time integral (LVOT VTI) in the apical 5-chamber view [3]. However, obtaining this measurement in the intensive care setting can be challenging. Therefore, this study aimed to evaluate the diagnostic accuracy of the right ventricular outflow tract velocity-time integral (RVOT VTI) variability during passive leg raising as a potentially reliable alternative for predicting fluid responsiveness.

Materials and Methods: This prospective observational study was conducted in the intensive care unit of the National Institute of Oncology of RABAT. We included patients with arterial hypotension. Ultrasound measurements of LVOT VTI and RVOT VTI were performed before and after PLR. Patients with LVOT VTI variability ≥ 13% received fluid resuscitation with 250 cc of 0.9% saline over 2 minutes. Then, a second transthoracic ultrasound was performed to measure the cardiac output variability. If it is ≥ 10%, the patient is considered a fluid responder.

Results: RVOT VTI measurements were obtained in all 55 patients. Of these, 71.4% were not intubated and 47.6% were receiving vasoactive drugs. The RVOT VTI variability after PLR showed a strong correlation with LVOT VTI variability (r = 0.85; p < 0.001). as well as with cardiac output variability after fluid resuscitation (r = 0.49; p < 0.012). The area under the ROC curve for RVOT VTI variability during PLR was 0.93. An increase of RVOT VTI ≥ 13.04% during PLR predicted fluid responsiveness with a sensitivity of 94.44% and a specificity of 86.36%.

Conclusion: RVOT VTI variability measurement during PLR is reliable for predicting fluid responsiveness and guiding fluid resuscitation for critically ill patients, particularly those with difficult LVOT VTI measurements.

51AP02-10

Risk of underdiagnosis of factor XIII deficiency in patients on ECMO: lessons from a complex

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Background: Managing patients on ECMO is one of the most challenging aspects of intensive care. Achieving a balance between thrombosis and bleeding is often difficult. Hemostatic complications, particularly bleeding, are the most frequent during this therapy, despite normal results on conventional coagulation tests. In this context, several studies have explored potential causes. identifying acquired deficiencies of critical coagulation factors. such as FXIII, which can lead to ineffective management if left undiagnosed.

Case report: We report a case of a 68-year-old female with a history of diabetes and rheumatoid arthritis who underwent an urgent laparoscopic appendectomy for acute appendicitis. In the early postoperative period, she developed biphasic acute respiratory distress syndrome (ARDS) with possible superimposed acute interstitial pneumonia, requiring veno-venous ECMO support. During her ECMO course, she experienced airway hemorrhages and melena, necessitating blood transfusions, despite normal hemostasis test results. An acquired coagulation disorder was suspected, and factor quantification revealed deficiencies in Factor XIII, VII, and fibrinogen. After administration of Factor XIII and fibrinogen, bleeding was controlled. Factor VII was withheld due to its prothrombotic effects.

Discussion: This case highlights the complexity of coagulation disorders in ECMO patients and the risk of failing to detect acquired deficiencies of essential factors such as factor XIII, a fibrin stabilizer, even when conventional test results appear normal. The absence of established protocols for identifying these deficiencies contributes to the risk of underdiagnosis and suboptimal management.

References:

1. McMichael, A., Ryerson, L. et al. ELSO Adult and Pediatric Anticoagulation Guidelines. ASAIO Journal 68: p 303-310, March 2022.(2) Noitz M, Szasz J. et al. Acquired Factor XIII Deficiency Is Common during ECMO Therapy and Associated with Major Bleeding Events and Transfusion Requirements. J Clin Med. 2023 Jun 18;12(12):4115.

Learning points: It is crucial to suspect and assess for acquired coagulation factor deficiencies in ECMO patients, particularly when conventional tests show no abnormalities. Early identification of these deficiencies, such as factor XIII deficiency, can improve prognosis and prevent severe complications. Continued research and case collection are necessary to develop more precise and standardized diagnostic and treatment strategies.

51AP02-12 Use of LUS for early diagnosis of pneumonia in critically ill patients

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Background: Septic shock or pneumonia sepsis is a health problem associated with critical care units. Pneumonia associated with mechanical ventilation, according to cohorts, affects up to 10% of mechanically ventilated patients and has a mortality of up to 30%. The use of POCUS in acutely deteriorating IMV patients allows the identification of possible foci of pulmonary condensation associated with infection. This, in addition to the patient's clinical signs such as hypotension, increased inflammatory parameters or fever, allows early initiation of targeted antimicrobial therapy, shortening the time from clinical deterioration to initiation of treatment.

Case report: We present three patients admitted to the ICU who required intubation and connection to mechanical ventilation during admission for reasons unrelated to respiratory infection. The mean age of the patients was 56 years, two of them were female and one male. In all three patients, 72-96h after the start of IMV, there was acute clinical deterioration with the need to increase vasopressors, increased CRP and PCT, with no identifiable infectious focus at the start and with a normal chest X-ray. In the LUS, consolidation focus were identified at lung level, with a positive doppler pattern in the image, suggestive of infection. Sputum cultures and blood cultures were taken and empirical antibiotic treatment was started until the results of the cultures were obtained. Chest X-ray, performed 48 hours after the onset of the symptoms, identified (by an expert radiologist) infiltration with air bronchogram in the image suggestive of pneumonia.

Discussion: The use of POCUS is becoming increasingly common in intensive care units. Regular ultrasound examinations of admitted patients allow early diagnosis of possible foci of infection such as pulmonary infiltrates or abscesses and the differential diagnosis of haemodynamic alterations. In addition to the daily physical examination of patients, a protocolised ultrasound examination including cardiac, pulmonary, abdominal and VEXUS assessment should be considered.

References:

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Learning points:

Using POCUS as a daily protocol in ICUs allows early diagnosis and early identification of complications as well as early targeted treatment.

51AP03-1

MicroRNA profiling in lung tissues of a murine aspiration pneumonia model

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Background and Goal of Study: Acute lung injury resulting from aspiration pneumonia is a serious complication of anaesthesia, for which no effective therapy is currently available. MicroRNAs, known for their role in post-transcriptional gene regulation, have emerged as promising therapeutic targets. To explore their expression in aspiration pneumonia, microRNA profiling of lung tissues was conducted using a murine model.

Materials and Methods: Adult male C57BL/6 mice in the AP group (n = 3) were oropharyngeally administered 50 µL of a gastric content mimic containing a xanthan gum-based thickener, pepsin, and lipopolysaccharide (pH 1.6). The Sham group (n = 3) received 50 µL of normal saline. After 48 hours, the mice were euthanized, and lung tissues were collected for injury assessment and microRNA profiling. Small RNA sequencing was performed, followed by bioinformatic analyses, including Gene Ontology (GO) analysis and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment analysis.

Results and Discussion: Lung injury in the AP group was characterized by histopathological changes, elevated injury scores, impaired lung function, increased leukocyte infiltration, and tissue oedema, all significantly different from the Sham group (p < 0.05). Small RNA sequencing identified 54 differentially expressed microRNAs, including 11 upregulated and 15 downregulated (fold change > 2, adjusted p < 0.05), GO analysis revealed active roles for cell migration and immune regulation in the observed lung injury. KEGG pathway enrichment analysis highlighted the MAPK and PI3K/Akt pathways as key mechanisms. Notably, miR-206-3p was the most significantly downregulated and miR-29c-3p the most significantly upregulated, suggesting their potential involvement in inflammation through MAPK and PI3K/Akt pathway dysregulation.

Conclusion(s): MicroRNA profiling and bioinformatic analysis identified the MAPK and PI3K/Akt pathways as key mechanisms underlying acute lung injury induced by aspiration pneumonia. Notably, the differential expression of miR-206-3p and miR-29c-3p highlighted their potential as therapeutic targets for the treatment of aspiration pneumonia.

Acknowledgements: This study was supported in part by a grant (grant No.: NSTC 113-2314-B-038 -015 -) from the National Science and Technology Council, Taiwan.

Did long-term mortality of very old intensive care patients change between 2005-2009 and 2015-2019? A retrospective cohort study with propensity score matching

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Background and Goal of Study: Progress in medical science and technology has had a huge impact on the treatment of patients in ICU the last fifteen years. This progress should ideally ensure better survival of patients during their stay in the ICU as well as after discharge. Our most vulnerable Very oldIntensive care Patients (VIP), over 80 years old, represent an expanding population in ICU. Comorbidity, polypharmacy and frailty are some extra challenges to handle in VIPs. Goals: To examine the survival of VIPs after ICU admission and to compare the survival for up to 12 months of 2005-2009 (0509) and 2015-2019 (1519).

Materials and Methods: Single-center retrospective cohort study with propensity score matching (PSM) at Sint Blasius General Hospital, Dendermonde, Belgium with a 12 beds mixed medicalchirurgical ICU. An ICU database query identified all VIPs admitted between 0509 and 1519. Crossmatching to the Belgian national register showed the actual vital status or date of death. To adjust for confounding factors (sample size, age, gender, SAPS II, APACHE IV admission diagnosis), PSM was used. Outcomes: Length of Stay (LOS) ICU, in-hospital mortality. Statistics: Chisquare, MannWhitney U-tests. To assess survival rates up to 12 months after ICU admission, Kaplan-Meier survival analysis with log-rank test was performed; significance; p < 0.05.

Results and Discussion: After PSM, two groups of 506 patients who were comparable were obtained. Demographic and outcome data are shown in Figure 1. PSM removed bias by sample size, age, sex, APACHE IV admission diagnosis, and SAPS II score. LOS ICU was significantly shorter in 1519. Hospital mortality did not differ. Kaplan-Meier survival analysis showed no changes in mortality up to 12 months after ICU admission.

Conclusion(s): After correcting for biases with PSM, in-hospital mortality and mortality up to 12 months after ICU admission did not differ significantly. In both study periods, most VIPs died within the first month after ICU admission. The assumption that 15 years of advancements in medicine would enhance the survival rates of this population proved unfounded.

51AP03-4

Methemoglobinemia in a patient with iatrogenic colonic perforation and bilateral pneumothorax: case report

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Background: We aim to present a case of iatrogenic colonic perforation during colonoscopy, which was subsequently followed by methemoglobinemia.

Case report: A 75-year-old female patient was scheduled for endoscopy and colonoscopy.colonoscopy, colonic perforation occurred/maging revealed pneumoperitoneum and bilateral pneumothorax, necessitating transfer to the emergency department (ED). Hypoxia continued after the patient had a chest tube inserted. Methemoglobinemia was observed to have developed. Blood gas analysis showed pH: 7.45, pCO2: 34 mmHg, pO2: 21.9 mmHg, SpO2: 43.1%, and MetHb: 28.9%. Methemoglobinemia was diagnosed, and 300 mg/kg ascorbic acid was administered, with no improvement in MetHb levels. The patient, now hypotensive, was admitted to the intensive care unit (ICU) on low-dose inotropic support and mechanical ventilation. Repeat blood gas analysis revealed worsening MetHb (31%), prompting methylene blue administration at 1 mg/kg after ruling out G6PD deficiency. Three hours post-methylene blue, blood gas values improved significantly MetHb:3.1%.Postoperatively, the patient recovered without requiring further inotropic support. By day 6, chest tubes were removed, and she was transferred to the ward in stable condition. **Discussion:** Treatment involves discontinuing the offending agent. MetHb levels below 20% usually resolve spontaneously, but levels above 20% require intervention with ascorbic acid or methylene blue. Methylene blue facilitates MetHb reduction via the NADPH methemoglobin reductase system, but its efficacy depends on the absence of G6PD deficiency. Ascorbic acid provides a non-enzymatic alternative. In this case, methylene blue was effective after ascorbic acid failed.

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Learning points: Methemoglobinemia, though more common in early life, can occur in adults, particularly during procedures involving local anesthetics. Prilocaine is frequently used during chest tube placement for pneumothorax. Persistent desaturation in such cases should prompt suspicion of MetHb, and blood gas monitoring should continue until the diagnosis is confirmed or excluded.

Epidemiological insights into postoperative acute kidney injury: risk factors and outcomes in cardiac surgery

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Background: Acute kidney injury (AKI) is a frequent and severe complication after cardiac surgery, being this kind of surgery the second From skin to airway: employing ultrasonography in the prediction of difficult laryngoscopy and ventilationFrom skin to airway: employing ultrasonography in the prediction of difficult laryngoscopy and ventilationmost common cause of AKI in the intensive care unit (ICU).Patients developing AKI have increased morbidity and worse surviving rates than those with normal renal function. The aim of this study is to review the epidemiology of AKI on postcardiac surgery patients at ICU as well as the preoperative risk factors and morbimortality.

Materials and Methods: A prospective cohort study was conducted including 251 patients from a single center, over the age of 18, who underwent cardiac surgery with extracorporeal circulation. Patients were excluded if they explicity refused consent, were on chronic hemodialysis treatment or were in the terminal phase.

Results and Discussion: The overall incidence of AKI was 32%: stage 1 AKI 22,5%, stage 2 AKI 2,7% and stage 3 6,7 % there was a 15,5 % of all AKI cases progressed to persistent AKI and 12,4 % progressed to chronic kidney disease. The preoperative quantitative risk factors were significant (p<0,05) included: age, left ventricular ejection fraction, prior creatinine clearance ,previous urea levels and baseline creatinine. The significant qualitative risk factors were: NYHA functional class, insulin-dependent diabetes mellitus, extracardiac peripheral artery disease, pulmonary hypertension, arterial hypertension, prior diuretic treatment and diuretic treatment. Additionally, patients with renal damage had a higher infection rate (76,96%) a greater need for polytransfusion (70,835 %), higher mortality (81,23%) and a longer hospital stay; all with p-value of <0,001. The results confirm that there is a statistically significant association between patients with preexisting renal dysfunction with extracorporeal circulation and the development of AKI.

Conclusion(s): This study demonstrates a significant association between pre-existing renal dysfunction and the development of AKI in patients undergoing cardiac surgery with extracorporeal circulation. Patients with renal impairment experienced higher infection rates, increased need of polytransfusion, greater mortality, and longer hospital stays. These findings align with expected AKI incidence rates in cardiac surgery as reported in previous literature.

References:

Tseng, P. Y., Chen, Y. T., (2020). Prediction of the development of acute kidney injury following cardiac surgery by machine learning. *Critical care (London, England)*, *24*(1), 478.

51AP03-6

Management of Lercanidipine-induced Lyell's syndrome

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Background: Toxic Epidermal Necrolysis (TEN) or Lyell's syndrome is characterized by mucocutaneous erosion, epidermal necrosis and detachment, vesicle formation and systemic inflammation. It is primarily triggered by medications¹. Although a rare disease, with an incidence of 1-2 per 1,000,000 people, it has a high degree of morbidity, and mortality can reach up to 48%¹. TEN patients require a high level of medical and surgical care, often requiring hospitalization in a Burn Unit (BU).

Case report: We present the case of a 38-year-old male who developed TEN 10 days after starting an antihypertensive medication, Lercanidipine. Initially, the patient presented with macular, bullous lesions and positive Nikolsky sign in 2% of his body surface area (BSA). He was diagnosed with Stevens-Johnson Syndrome. After 4 days the lesions affected more than 30% BSA. The diagnosis was updated to TEN, and the patient transferred to the BU. A SCORTEN score of 3 was calculated (mortality rate of 35%).

After 48 hours, the lesions had spread to over 70% BSA, sparing only the head. The therapeutic plan encompassed intensive support and monitoring, daily hydrotherapy and wound care. Strict aseptic techniques were maintained during patient contact. Goal-directed fluid therapy, daily complete laboratory assessments, bacteriological screening and chest radiographs were performed. Pain was managed with patient-controlled analgesia of Morphine, Ketamine and Droperidol plus peripheral analgesia. Hydrotherapy sessions were provided with a combination of Propofol, Ketamine, Dexmedetomidine, and Fentanyl, allowing effective wound care. Patient care involved daily ophthalmology evaluation, pulmonary rehabilitation and oxygen therapy. By the 24th day of hospitalization, the patient showed over 90% healing of the affected skin areas and was discharged home.

Discussion: This case underscores the critical importance of intensive and rigorous care in the management of TEN, particularly in a specialized BU. Rapid disease progression shows the unpredictable nature of this severe drug-induced reaction.

References. 1- Paulmann M, Mockenhaupt M. Allergo J Int. 2019;28:311–326.

Learning points: Timely diagnosis, close monitoring, aggressive supportive measures and wound care were essential to prevent complications and improve the patient's outcome. Moreover, it serves as a crucial reminder of the need for vigilance in prescribing common medications, especially when initiating new treatments.

Actinomyces odontolyticus sepsis in the ICU: an unexpected enemy lurking in the shadows!

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Background: Actinomyces odontolyticus infections in the ICU setting are rare and typically occur in the context of severe, invasive infections (sepsis, abscess formation) or secondary complications (mastoiditis).

Case Report: A previously healthy 30 years old was admitted to the hospital due to high fever, confusion, hypotension, and dyspnea. A month before admission, he was treated for otitis media.Brain MSCT revealed thrombosis of the right internal jugular vein.right sigmoid, and transverse sinuses with inflammatory changes in the right ear and mastoid cells.Lumbar puncture was not performed due to thrombocytopenia(25). Neither neurosurgical nor otosurgical treatment was indicated. Broad-spectrum antibiotics were initiated. After he developed respiratory insufficiency, was transferred to the ICU and mechanically ventilated due to severe pneumonia, sepsis, mastoiditis, thrombosis, and meningism. A thoracic drain was inserted for pneumothorax. Actinomyces odontolyticus was isolated from blood cultures. Treatment included intravenous penicillin 24 MIU for 6 weeks, vasopressors, bronchoaspiration and surgical procedures:myringotomy, mastoidectomy, antrotomy. He developed HIT, and was treated with fondaparinux. The patient experienced massive hemoptysis with hemorrhagic shock and was stabilized with transfusions, plasma, and tranexamic acid. He was extubated after 10 days. After 20 days in the ICU he was discharged to pulmonology and later home. He continued oral penicillin for one year. He made a full recovery.

Discussion: Managing Actinomyces odontolyticus sepsis in the ICU involves diagnostic challenges.prolonged treatment reguirements, and potential complications. The slow-growing nature of the organism and its nonspecific symptoms often delay diagnosis, emphasizing the need for multimodal diagnostics. Treatment requires extended antibiotic therapy, typically high-dose IV Penicillin for 6 weeks followed by months of oral antibiotics. A multidisciplinary approach,including various specialists is essential. Complications such as HIT, venous thrombosis, and dissemination require prompt recognition and management. ICU clinicians should maintain a broad differential diagnosis and leverage microbiology to guide therapy, sepsis protocols, and treatment to avoid unnecessary broad-spectrum antibiotics.

Learning points: Timely diagnosis, aggressive antibiotic therapy and coordinated care are critical to improving survival and reducing long-term complications in Actinomyces odontolyticus sepsis.

51AP03-9

Treatment algorithm for acute pancreatitis caused by hypertriglyceridemia and lipid apheresis

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Background: Acute pancreatitis (AP) can result from various etiological factors, including alcohol consumption, medications and hyperlipidemia. Hypertriglyceridemia (HTG) is the third most common cause of acute pancreatitis, due to global changes in dietary habits incidence of hyperlipidemia and its association with acute pancreatitis has been increasing.

Regardless of the etiology, the management of acute pancreatitis focuses on maintaining perfusion, providing hemodynamic support, infection control. Lipid apheresis is a medical procedure that involves the removal of lipoproteins, including triglycerides, from the bloodstream.

Case Report: A 32-year-old, 120 kg male patient with a medical history of type 2 diabetes mellitus (DM) and HTG presented to the emergency department with complains of nausea and vomiting. Laboratory findings were as follows: Amylase: 487 U/L, Lipase: 1680 U/L, Triglycerides: 2668 mg/dL. CT scan revealed a Balthazar C stage. Upon admission to the ICU, the patient was hypoxemic and had metabolic acidosis, and therefore he was intubated and placed on mechanical ventilation. The patient was started on insulin therapy and fenofibrate, along with lipid apheresis on the same day.

Four sessions of lipid apheresis were performed, with triglyceride levels gradually decreasing from 2668, 1351, 538 mg/dL. On the fourth day of mechanical ventilation support, the patient developed severe ARDS, and inhaled NO therapy was initiated.

As sepsis developed, adsorbent treatment (MG 350 - Biosky) was administered for two days. The patient was extubated on the 16th day of hospitalization and was transferred to the general ward on the 21st day.

Discussion: A 32-year-old, 120 kg male patient with a medical history of type 2 diabetes mellitus (DM), hypertension (HT), and hypertriglyceridemia presented to the emergency department with complains of nausea and vomiting. Patient's medical history, revealed that he used matofin, lustral, beneday and lipanthyl. In his family there was a history of coronary artery disease related death (father) and hypertriglyceridemia/hypercholesterolemia.

References:

1. Loveday BP, Srinivasa S. High quantity and variable quality of guidelines for acute pancreatitis: a systematic review. Am J Gastroenterol. 2010;105(7):1466-1476.

Learning points: AP: A life-threatening condition that can result from various causes, including hypertriglyceridemia.

Lipid Apheresis:Lipid apheresis is important in the treatment of HTG.

Correlation between cardiac output determined by echocardiography and indirect calorimetry in critically ill patients in cardiogenic shock treated with extracorporeal circulatory support - a computational model

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Background and Goal of Study: Assessment of cardiac function in patients receiving extracorporeal cardiovascular support via venoarterial extracorporeal life support (VA-ECLS) is challenging. Pulse contour analyses are not applicable for technical reasons. thus sonography is usually performed to estimate cardiac output (CO). Since the assessment of CO function is of great interest in VA-ECLS weaning, additional methods for CO measurement are appreciated. Therefore, this study investigates whether CO can be determined by indirect calorimetry.

Materials and Methods: ECLS oxygen uptake (VO_{2-ECLS}) is calculated by blood gas analysis whereas oxygen uptake of the heartlung circulation (VO_{2-lung}) is measured by indirect calorimetry. For similar post-oxygenator and arterial oxygen saturations and partial pressures as well as similar oxygen extraction, it is assumed that CO divided by VO_{2-lung} equals ECLS blood flow (BF_{ECLS}) divided by VO_{2-ECLS}. Thus, CO may be estimated as follows: CO = BF_{ECLS}/VO_{2-ECLS} x VO_{2-lung}

We applied this technique and formula in a male patient with central VA-ECLS cannulation and compared the CO measured by the above mentioned formula with CO measured by echocardiography.

Results and Discussion: CO determined by echocardiographic measurement of the velocity-time integral (VTI) in the left ventricular outflow tract (LVOT) in the apical five-chamber view (Heart rate 60/min, VTI 13cm, LVOT diameter 23mm) was 3.24L/min. Post-oxygenator pO₂ and radial arterial pO₂ were both 129mmHg. Taking into account pre- and postoxygenator values of hemoglobin, oxygen saturation and $\mathrm{BF}_{\mathrm{ECLS}},\,\mathrm{VO}_{\mathrm{2-ECLS}}$ was calculated as 124mL/min. Indirect calorimetry indicates a VO_{2-lung} of 131mL/ min. Applying the above mentioned equation gives a CO value of 3.26L/min. The deviation from echocardiography derived CO is less than one percent.

Conclusion(s): Indirect calorimetry might be a promising non-invasive method for evaluation of CO in VA-ECLS patients. Further research is needed to validate this method of CO assessment.

51AP03-11

Reactive airway dysfunctional syndrome (RADS) in pediatric inhalational burns: A case report

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Background:

Pediatric inhalational injury is a significant predictor of morbidity and mortality in pediatric burns.

This case report describes the successful management of a patient with RADS and his ICU course, highlighting the importance of a multidisciplinary approach.

Case report:

A 10-year-old boy was rushed to emergency after he sustained thermal burns following a firecracker explosion and getting trapped inside the room for around 15 to 20 min. On arrival resuscitation with IV fluids done followed by dressing of the burn wounds and intubated i/v/o facial burns and inhalational injury with respiratory distress. Bronchoscopy showed mild edema with congestion of the bronchus.

Started on broad-spectrum antibiotics, nebulization with heparin, NAC, bronchodilators, and steroids. Later reintubated I/v/o increased work of breathing, respiratory fatigue, persistent hypercarbia with metabolic acidosis, and tracheostomised. A weaning trial was done but failed and RADS was diagnosed. Kept on CPAP later to BIPAP machine. Weaned off from the ventilator to room air and decannulated and discharged.

Discussion:

RADS was first described by Brooks et al to designate an asthmalike condition that may develop following exposure to toxic gases. Criteria of RADS diagnosis include 1) Asthma-like symptoms such as cough, wheezing, and dyspnoea, 2) occurring within a few hours after exposure, with persistence for at least 3 months.3) Absence of previous respiratory symptoms.4) No evidence of other pulmonary diseases.5) High-level exposure to gas/smoke/ fumes.6) Pulmonary function tests that usually show airflow ob-

Management protocol of RADS begins with suspected inhalational injury in pediatric burns including a primary burn care survey, If the patient is stable, fluid management and dressings are done. Followed by a bronchoscopy if it is normal standard burn care management is done. If the patient is unstable or Bronchoscopy shows vocal cord edema or mucosal erosions then the patient is intubated and started on fluid Management, intravenous steroids, inhalational bronchodilators/steroids, Empirical antibiotics, and Nutritional supplements. The weaning trial is conducted and extubated or decannulated after performing the cuff leak test. A multidisciplinary approach including Critical care medicine, Plastic and reconstructive surgery, Paediatric pulmonologist, Radiologist, ENT, and Dietician is required

Management of severe blunt thoracic trauma with veno-venous ECMO and concurrent cardiac surgery requiring extracorporeal circulation

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Background: Veno-venous extracorporeal membrane oxygenation (VV-ECMO) in trauma patients is controversial but critical when lung damage is severe, and treatments fail. Though rare, trauma-related injuries may require urgent cardiac surgery, posing significant anesthetic and surgical challenges.

Case Report: A 44-year-old male was admitted to the ICU after a traffic accident causing blunt trauma. He had left hemopneumothorax, rib fractures, a contained rupture of the posterior ascending aorta, cerebral contusions, and alveolar hemorrhage. Despite hemopneumothorax drainage and mechanical ventilation, severe hypoxemia persisted. Echocardiography confirmed normal cardiac function and ruled out tamponade. Refractory hypoxemia and alveolar hemorrhage led to heparin-free VV-ECMO, decided in an interdisciplinary manner. After lung contusion stabilization, the ascending aorta was replaced under extracorporeal circulation. Postoperatively, he was reconnected to heparin-free VV-ECMO. After 72 h, with no bleeding and stabilized cerebral contusions, heparin was reintroduced, and VV-ECMO weaning began. Persistent thrombocytopenia, initially linked to high ECMO flow rates, worsened after heparin was introduced. Anti-heparin antibody testing confirmed heparin-induced thrombocytopenia (HIT). VV-ECMO continued heparin-free with prophylactic fondaparinux during advanced weaning. The patient recovered without complications. VV-ECMO and mechanical ventilation were discontinued on days 8 and 15, respectively, with ICU discharge on day 20.

Discussion: This case highlights VV-ECMO's role as a lifesaving intervention in severe trauma. Hemorrhage is a critical concern, making heparin-free therapies essential in specific scenarios. Persistent thrombocytopenia required differentiating high ECMO flow-related platelet consumption, heparin-induced thrombocytopenia (HIT), and trauma-induced coagulopathy.

References:

1. Ried M, Bein T, Philipp A, et al. Extracorporeal lung support in trauma patients with severe chest injury and acute lung failure: a 10-year institutional experience. *Crit Care*. 2013;17(3):R110. Published 2013 Jun 20.

Learning Points:

- Heparin-free VV-ECMO is essential in managing severe blunt trauma with bleeding risks.
- Adhering to damage control principles (ABCD) is vital for life-threatening injuries.
- Prompt identification and tailored management of thrombocytopenia are critical for patient recovery.

51AP04-3

Hepato-pericardial fistula in a patient with hepatocarcinoma: a case report

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Background: Hepato-pericardial fistula is a rare but serious complication in patients with hepatocarcinoma on cirrhotic liver, especially after treatments such as radiotherapy or tumor ablation. This condition is characterized by an abnormal communication between the liver and the pericardium, which can lead to serious infections, as in this case, where a pericardial effusion with bilious-purulent fluid was diagnosed after the development of a biliary sepsis and multiorgan complications.

Case Report: This is a 52-year-old patient with a history of hepatocarcinoma on cirrhotic liver due to hepatitis C virus (HCV, already eradicated, treated with microwave ablation and radiomebolization. One year later he presented with acute on chronic pancreatitis, complicated by septic shock due to purulent cholecystitis.

During his stay, he developed pericardial effusion with positive culture for S. anginosus, suggesting a hepatopericardial fistula. As a result, he developed renal failure, acute liver failure, ARDS, and gastrointestinal bleeding, which required intensive management. Despite ICU efforts, the patient died due to multiorgan failure.

Discussion: Purulent pericarditis is a rare clinical entity, characterized by pericardial effusion of a purulent nature that usually occurs by extension from a contiguous bacterial infectious focus or by hematic dissemination. In this case, the proximity of the tumor to the pericardium and the radiation received facilitated the formation of a fistula, which was confirmed by the finding of bilious-purulent fluid in the pericardium.

This condition requires targeted treatment, with hemodynamic support and control of the focus by pericardiocentesis and antibiotherapy. Echocardiography allows us to evaluate signs of cardiac tamponade and, above all, to perform a guided pericardiocentesis.

Reference:

Thiemann M, Benhidjeb T, Anders S, Gebauer B, Strik MW. Hepato-pericardial fistula following radiofrequency ablation (RFA) for liver metastasis: a case report and review of the literature. Langenbecks Arch Surg. 2008 Nov;393(6):1013-6. doi: 10.1007/s00423-008-0293-7. Epub 2008 Feb 12. PMID: 18266001.

Learning points: It is important to have a clinical suspicion of the main complications that can occur in patients deteriorating in the intensive care unit. But we should underestimate the clinical examination, monitoring and bedside tools such as ultrasound, which can help us to consider alternative diagnoses such as this one.

51AP04-4 Are arterial lines properly setup for hemodynamic monitoring in the ICU?

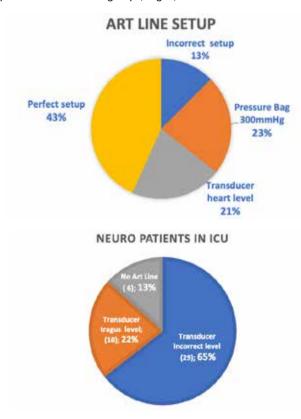
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Background and Goal of Study: An arterial line, correctly set up, is vital in the ICU for respiratory and cardiovascular management. However, issues like proper zeroing and damping are often overlooked. This project aims to evaluate the accuracy of arterial lines in ICU patients, particularly in neurotrauma, assessing for overdamping/underdamping and correct zeroing.

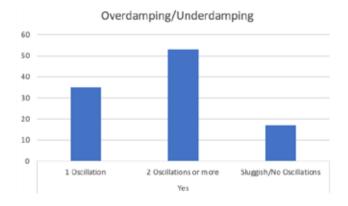
Additionally, we will record the use of vasoactive drugs and cardiac output monitors (e.g., PiCCO) across our ICUs.

Materials and Methods: We analyzed data from 142 patients admitted to the 5 ICUs (90 beds) at a tertiary-level hospital, evaluating the correct setup of arterial lines.

Furthermore, we assessed the subset of patients admitted for neurological conditions (TBI, SAH, ICH, IVH) to determine the proportion with arterial monitoring and the accuracy of transducer placement within this group (tragus).



Results and Discussion: 105 patients have arterial line inserted, 57% of them has imperfect setup and only 43% with the correct one: 65% of Neurotrauma patients had arterial line incorrectly levelled. 66% patients have no PiCCO line inserted but Noradrenaline infusion > 0.3 mcg/kg/min and damping is not correct most of the times.



Conclusion(s): Most ICU arterial setups are incorrect, requiring regular shift checks, comparison with non-invasive methods, and evaluation of PiCCO's appropriate use to improve monitoring accuracy. The use of PiCCO varies and lacks consistency. This may be worth addressing in the upcoming updates to vasopressor guidelines currently under review.

51AP04-5 Al and echocardiography in ICU: Are we really ready?

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Background and Goal of Study: The integration of Al (artificial intelligency) in critical care ultrasound enhances accuracy, efficiency, and effectiveness in complex, time-sensitive settings. This study evaluates AI tools embedded in ultrasound machines by comparing their performance to an expert practitioner, using FUSIC (Focused ultrasound in Intensive care) heart-qualified practitioners as a benchmark.

It also investigates whether AI can help novices achieve accurate and comprehensive scan results.

Materials and Methods: The study compared echocardiographic measurements by an expert and six non-expert trainees using Al tools on six patients and two healthy volunteers.

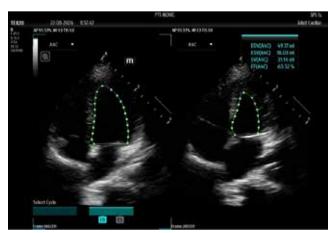


Figure 1. Ultrasound image of AI tool used for automated Ejection Fraction.

Parameters assessed included EDV(end diastolic volume), ESV (end sistolic volume), EF (ejection fraction) (Figure 1), DMIN (diameter mininum). DMAX (diameter maximum). VTI (Velocity time integral), and TIME. The expert performed manual measurements, while non-experts used automated AI tools . Both groups evaluated each patient.

Results and Discussion: Al significantly reduced the time required for exams. While end-diastolic volume measurements and VTI differed between experts and non-experts, other parameters. including ejection fraction (EF), end-systolic volume (ESV), and maximum inferior vena cava diameter, showed no significant differences (Table 1).

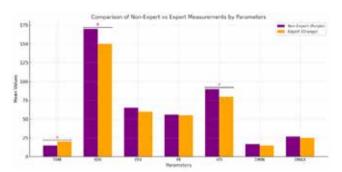


Table 1: The table shows the results for each parameter studied between the two groups: Expert (Gold Standard) and (Non-Experts).

Conclusion(s): Al tools enhance novice performance in cardiac evaluations, offering faster and reliable results, but still require expert supervision to ensure diagnostic accuracy and address limitations.

51AP04-6

Trends in dexmedetomidine use and its impact on delirium management in a surgical ICU: a sevenyear retrospective study

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Background and Goal of Study: Dexmedetomidine, a selective □2-adrenergic receptor agonist, is widely used for sedation in critically ill patients. This study examines seven-year trends in dexmedetomidine use in a South Korean surgical ICU and its impact on delirium incidence and severity using the ICDSC.

Materials and Methods: This retrospective study analyzed 6,140 patients admitted to an 18-bed surgical ICU from 2017 to 2023. Exclusions included duplicate admissions, cognitive impairments, and insufficient records. Data from the Severance Open Big Data Portal included demographics, ICDSC scores, and clinical outcomes. Statistical analyses evaluated risk factors, survival, and dosina.

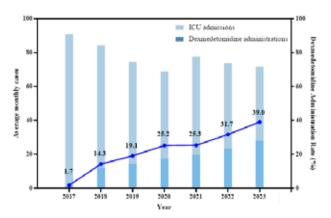
Results and Discussion:

Trends: Dexmedetomidine usage increased from 1.7% in 2017 to

Delirium and Risk: Dexmedetomidine recipients had higher ICD-SC scores (≥4: 46.1% vs. 13.9%, p<0.001). Risk factors included older age, psychiatric medication use, and prolonged ICU stays.

Dosing and Outcomes: Severe delirium cases required higher doses (0.147 mcg/kg/hour) and longer administration (3.84 days). Survival rates were lower in the Dex group (89.1% vs. 92.6%. p=0.014), attributed to the severity of underlying conditions rather than drug effects.

Implications: Dexmedetomidine serves as a symptom-focused treatment for severe delirium, emphasizing the need for tailored dosing protocols.



Conclusion(s): Dexmedetomidine plays a key role in ICU sedation, especially for high-risk delirium patients. While associated with greater delirium severity and longer ICU stays, it is essential for symptom management. Low-dose regimens for non-intubated patients warrant further study.

References:

Devlin JW, et al. Clinical Practice Guidelines for Pain, Agitation/ Sedation, Delirium, Immobility, and Sleep Disruption in ICU Patients. Crit Care Med. 2018;46:e825-e873. Korean Society of Critical Care Medicine. 2020 Korean Domestic ICU Status Survey Report. White Paper. 2020.

51AP04-7

Extracellular vesicles miRNA: searching for new biomarkers to enhance diagnostic accuracy of septic shock

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Background and Objectives: Sepsis is a severe condition marked by life-threatening organ dysfunction due to a dysregulated host response to infection. The aim of this study is to enhance the diagnostic accuracy of septic shock versus non-septic shock in postsurgical patients by identifying miRNAs derived from EVs that serve as specific biomarkers

Materials and Methods: a multicentric, prospective study that involved two distinct cohorts of adult patients undergoing surgery: (I) a discovery cohort from the Intensive Care Units (ICU) at "Hospital Clínico Universitario de Valladolid" and "Hospital Universitario de Toledo" in Spain, including 109 patients, 58 with septic shock and 51 with non-septic shock; (ii) a validation cohort from the same ICUs, consisting of 53 patients, 27 diagnosed with septic shock and 26 with non-septic shock. Predictive performance of miRNAs, along with sensitivity and specificity, was evaluated through area under curve (AUC) values using receiver operating curves (ROC).

Results: A total of 2880 miRNAs from miRbase were aligned. leading to the detection of 728 miRNAs, of which 426 plasma EV-derived miRNAs had sufficiently large counts for differential expression analysis. We selected the miRNAs with an area under the curve (AUC) over 0.7 and to assess the reliability of the selected genes as potential biomarkers, we tested them by gPCR in a separate study cohort (validation cohort). miR-100-5p showed the highest predictive value with an AUC of 0.921 (CI: 0.757-1.000), followed by miR-148a-3p (AUC: 0.889, Cl: 0.721-1.000) and miR-451a (AUC: 0.841, CI: 0.640-1.000).

Conclusion: Our study reveals a unique miRNA profile derived from EVs between post-surgical patients with septic shock and those with non-septic shock. Through differential analysis, we identified six that could serve as potential biomarkers for the early diagnosis of septic shock. Notably, the combination of these three miRNAs shows great promise as specific and complementary biomarkers for accurately diagnosing sepsis in post-surgical patients experiencing shock.

References:

1. Singer M, Deutschman CS, Seymour C, Shankar-Hari M, Annane D, Bauer M, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA [Internet]. 2016 Feb 23 [cited 2023 Feb 17];315(8):801-10. Available from: https://jamanetwork.com/journals/jama/ fullarticle/2492881

51AP04-8

Checking out the checklist - does introducing a checklist to test patient eligibility for ICU discharge improve patient outcomes?

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Background and Goal of Study: Untimely discharges increase the risk of readmission and mortality and can lead to capacity strain. Checklists were stipulated as tools to assess ICU patients' discharge readiness. In 2022, Hiller proposed a set of 28 criteria as an adult Intensive Care Unit-Discharge Readiness Checklist (ICU-DRC).

The goal of this study is to assess how applying the ICU-DRC affects patient outcomes: ICU length of stay (ICU-LOS), ICU readmissions, and ICU mortality.

Materials and Methods: The ICU-DRC was implemented into the standard discharge process of one of two distinct ICUs in a clinical hospital. We evaluated patient outcomes in the year prior to introducing the ICU-DRC, 2022, and in the first year of using the ICU-DRC, 2023. The outcomes were evaluated for both the Surgical ICU - Intervention group (IG) and the Medical ICU - Control group (CG). We extracted the data from hospital electronic records. As the data is not normally distributed, it is described by median (M), minimum (min), and maximum values (max) and has been analysed using a Mann-Whitney U test. Distributions of qualitative data were analysed using the χ^2 test.

Results and Discussion: In 2022, a total of 1,567 and 882 patients were treated in the IG and the CG, respectively; in 2023, the numbers of patients treated were 1.663 and 867. Fidelity in the application of the ICU-DRC was 65.7%. We found that in IG, ICU-LOS paradoxically increased significantly in 2023 as compared to 2022 (2022: M 1, min 0, max 80, vs.; 2023: M9, min 0, max 103, Mann-Whitney U test p<0.001).

When analysing the number of ICU readmissions within the same hospitalization, there was a significant difference in favour of those treated in the ICU only once in IG in 2023 (γ^2 (9)=51.99, P<0.001). Mortality rates were significantly lower in the IG in 2023 (2.4%) as compared to IG in 2022 (2.6%) and CG in both 2022 (14.5%) and 2023 (15.5%) (χ^2 (3)=275.71, P<0.001).

Conclusion(s): We found that the ICU-DRC had a positive effect on two out of three outcome measures, as it was associated with fewer ICU readmissions and lower ICU mortality. Due to the complexity of the ICU discharge process, it is unrealistic to expect a simple checklist to ameliorate all patient outcomes; however, our results justify the additional administrative burden on healthcare

Further stratification of data in relation to admitting diagnoses might better clarify the role that the ICU-DRC plays in changing patient outcomes.

51AP04-9

Asystole as a result of dysautonomia in Guillain-Barré syndrome: a case report

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Background: Dysautonomia can be a common finding in patients with Guillain-Barre Syndrome (GBS), present in up to 36%1 of cases. These phenomena can be life-threatening when they involve the cardiovascular system.

Case Report: We present the case of a 44 year old woman who developed loss of power in both lower limbs over two days, followed by paraesthesia in the upper limbs. Her past medical history included Covid-19 virus infection with prolonged symptoms two years ago and recent influenza vaccination ten days prior to presentation.

Other findings on examination included facial diplegia, voice changes, globally diminished reflexes, shortness of breath and dysautonomia as showed by urinary retention. A lumbar puncture was done which showed raised proteins (0.83g/L) and leukocytes (15/µI).

The patient was diagnosed with GBS variant and admitted to Intensive Care Unit (ICU) where intravenous immunoglobulin treatment was initiated. Due to increased work of breathing and inability to clear secretions, she was intubated two days after hospital presentation.

On day nine of admission the patient had an episode of unprovoked asystole lasting 45 seconds, treated with chest compressions over 1.5 minutes, returning to sinus rhythm without any need for adrenaline administration. Another episode of asystole followed 18 hours later, which resolved with chest compressions lasting around 30 seconds. After these two episodes the patient was referred to the cardiology service and temporary pacing wires were inserted.

Discussion: The risk of dysautonomia is higher in patients with tetraplegia, respiratory failure and bulbar symptoms². While cardiovascular symptoms can be variable, bradycardia is one of the most risky complications. It is difficult to identify patients at risk but studies have described volatile blood pressure, eyeball pressure testing and 24-hour heart rate power spectrum as indices of instability. While these patients are usually admitted to the ICU due to respiratory failure, the risk of cardiac arrest has to be noted during their care.

References:

- 1. Chakraborty T et al. Dysautonomia in Guillain-Barré Syndrome: Prevalence, Clinical Spectrum, and Outcomes.
- 2. Pfeiffer, G., et al. Indicators of dysautonomia in severe Guillain-Barré syndrome.

Learning Points: Asystole can be a possible complication in GBS with autonomic dysfunction and these cases would require close cardiac monitoring. A temporary pacemaker might be a necessary intervention.

51AP04-10

The role of eculizumab in acute antibody-mediated lung transplant rejection treatment

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Background: The post-operative management of patients undergoing lung transplantation presents significant challenges for intensive care units. Acute antibody-mediated rejection (AMR) is one of the most critical complications to consider. Conventional treatment consists of corticosteroids, plasmapheresis, immunoglobulins and monoclonal antibodies (1).

Case Report: We present the case of a woman whom after undergoing bilateral lung transplantation, she was diagnosed with AMR. She experienced respiratory deterioration, necessitating extracorporeal membrane oxygenation (ECMO) support for 23 days. Conventional treatment was iniciated. However, due to lack of clinical improvement and persistence of positive antibodies, we added Eculizumab to the regimen.

Subsequently, the patient showed significant respiratory improvement, enabling weaning from ECMO support and from invasive mechanical ventilation.

Discussion: A significant proportion of patients undergoing lung transplantation experience acute rejection within the first year of post-operation. Presently, there is no standardized treatment protocol for AMR. Nonetheless, advancements in understanding how to optimize immunosuppression and manage AMR have been made in recent years.

Treatment often involves a combination of antibody-lowering agents. While some patients respond favorably, others remain refractory to conventional therapies. Eculizumab, a monoclonal antibody that inhibits the C5 complement protein, offers a unique mechanism of action. By blocking the formation of the membrane attack complex, it disrupts complement-mediated intravascular hemolysis and prevents antibody binding to the graft, thereby mitigating severe tissue injury.

Currently, while there are multiple studies on the use of Eculizumab in kidney transplantation, further research is needed to provide solid scientific evidence supporting its use in lung transplantation. References:

1. Yannick D. Muller, et al. Acute Antibody-mediated Rejection 1 Week after Lung Transplantation Successfully Treated With Eculizumab, Intravenous Immunoglobulins, and Rituximab.

Transplantation 2018; 102: 301-03.

Learning Points: Acute antibody-mediated allograft rejection is a serious complication associated with poor prognosis, for which no standardized treatment currently exists. This case highlights an interesting path for further research into optimal treatment strategies for AMR in lung transplantation.

51AP04-11

Adding new paradigms to percutaneous dilatational tracheostomy - assessing the safety and feasibility of conventional, ultrasound guided and hybrid percutaneous tracheostomy techniques

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Background and Goal of Study: With increasing expertise, difficult percutaneous dilatational tracheostomies(PDT) with contraindications are being performed with adequate caution including Ultrasound Guided PDT (USGPDT) at bedside or minimally invasive Hybrid PDT (HPDT) in operation theatre (OT).

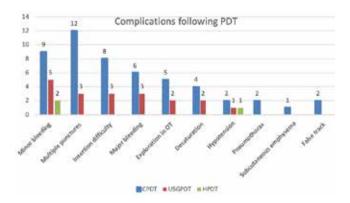
We hereby are presenting our experience regarding conventional, hybrid and ultrasound guided techniques of PDT and compare the procedure related complications and outcome of difficult tracheostomies in 285 critically ill patients done in our intensive care units retrospectively.

Materials and Methods: This retrospective observational study was done in the ICUs of a tertiary care hospital after ethical approval. High risk patient for tracheostomy was defined as patient with coagulopathy with INR>1.5, platelets < 100,000/cc, cervical spine injury, distorted neck anatomy, morbidly obese BMI >35, redo tracheostomy, post radiation, thyroid pathology, post cervical spine fixation surgery, high PEEP requirement.

Data was collected from a post tracheostomy pre-filled performa and data regarding complications and outcome was collected. The data generated was analysed using percentages, proportion and Chi square test for qualitative variables. A p-value of less than 0.05 was considered as statistically significant.

Results and Discussion: In high-risk group patients either UGP-DT or HPDT was mostly performed. The mean duration of the procedure was longer in UGPDT and HPDT group than conventional PDT. Common complications observed in patient population were minor bleeding (n=16,22%), multiple punctures (n=15,21%) and insertion difficulty (n=11, 15%).

Major bleeding was seen in 9 patients and 7 patients needed exploration in Operation Theater. Overall complication rate was highest in CPDT (n=51) followed by USGPDT (n=19) (figure 1). Hybrid percutaneous dilatational tracheostomy had the least complications was performed in 12 patients with visible pulsations and thyroid enlargement and none of the patients had any procedural and post procedural complications.



Conclusion(s): UGPDT is a safer bedside procedure especially in high-risk groups and HPDT in OT can be performed in patients with bleeding tendencies and difficult neck anatomy.

51AP04-12

Impact of continuous renal replacement therapy using the oXiris hemofilter on acute decompensated chronic heart failure secondary to infection

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Background and Goal of Study: Infections represent an important emerging clinical problem that cause decompensation of heart failure (HF). It is reported a high hospital infection rate (45.8%) and relevant mortality (21,5%) among patients with decompensated HF[1].

Our aim is to assess the impact of oXiris filter on acute decompensated HF caused by infection.

Materials and Methods: This study included 10 patients with heart failure with reduced ejection fraction (HFrEF), all of whom had cardiac resynchronization therapy defibrillators (CRTDs) implanted for dilated cardiomyopathy. These patients were managed in intensive care units (ICU) of two hospitals for decompensated heart failure and concomitant infection.

They were divided into two groups: one group underwent intermittent haemodialysis (IHD) using a polysulfone membrane filter, while the other group was treated with the oXiris filter, all at the Risk (R) stage of the RIFLE classification.

The study monitored heart rate (HR), blood pressure (BP), and ICU mortality outcomes.

Results and Discussion: The oXiris group demonstrated an increase in BP (30±3/10±2 mmHg) and a greater reduction in HR (25±6 bpm) 36 hours post-continuous renal replacement therapy (CRRT) compared to the IHD group, which exhibited a decrease in BP (10/5±2 mmHg) and a smaller reduction in HR (10±2 bpm). Mortality was lower in the oXiris group (1/5) compared to the IHD group (3/5). oXiris, a high-adsorption membrane designed to simplify the delivery of blood purification therapy for patients requiring simultaneous removal of inflammatory mediators, endotoxins. and CRRT [2], has demonstrated improved outcomes in patients.

	oXiris group (n =5)	IHD group (n=5)
Age/years	67±6	65±7
EF (ejection fraction) %	27±7	29±6
CRT-D	5	5
AF (atrial fibrillation)	5	5
Procalcitonin ng/ml	1±0,4	1±0,3
Mechanic ventilation (n)	5	4
HR before CRRT/IHD	120±15	125±10
HR 36 hour after CRRT/IHD	95±9	115±8
BP(mm Hg) hour before CRRT/IHD	90±15/50±10	95±15/55±10
BP(mm Hg) 36 hour after CRRT/IHD	120±12/60±12	90±10/50±8
Death	1	3

Conclusion(s): Initiating oXiris treatment at the R stage of the RIFLE classification in patients with decompensated HF secondary to infection significantly improved hemodynamics, decreased the need for vasoactive drugs, and enhanced survival outcomes. References:

- 1. Cardoso JN, Del Carlo CH, Oliveira Jr MT, Ochiai ME, Kalil Filho R, Pereira Barretto AC. Infecção em pacientes com insuficiência cardiac descompensada: mortalidade hospitalat e evolução. Arg Bras Cardiol. 2018;110(4):364-370.
- 2. Malard B, Lambert C, Kellum JA. In vitro comparison of the adsorption of inflammatory mediators by blood purification devices. Intensive Care Med Exp. 2018;6(1):12.

51AP05-1

Small-volume blood sample collection tubes to reduce iatrogenic anemia in stroke patients admitted to intensive care: the difficulties we faced in preliminary study; importance of education in all sites

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Background and Goal of Study: Anemia is a common problem in intensive care patients (ICUp). The cause of anemia is multifactorial and frequent phlebotomy has been reported as a contributing factor. The aim of our study is to investigate the effect of SvVT on reducing iatrogenic anemia in stroke patients admitted to intensive care(SP-ICU).

	SvVT (n=1500)	SVT (n=545)	р
Hemolysisl	1	0	N/A
Insufficient sample volume	2	0	N/A
Inappropriate sample volume	15	0	N/A
Clotted sample	52	16	0,55
TOTAL	68	16	0,11

SvVT:Small volume tubes;SVT:Standart volume tubes N/A:not applicable

Table 1: Distribution of error types in small volume and standard volume EDTA containing tubes (n=2045).

Materials and Methods: SP-ICU were randomly assigned to two groups. SvVT were used in the first group, while standard volume tubes (SVT) were used in the second between 5.5.2024 and 5.6.2024 as a preliminary study. Patients hospitalized >7 days were included. Hemoglobin values (HgV) at 10 and 30 days of admission, major-minor bleeding events, transfusions, the rejection rates and causes of blood collection tubes were planned to be recorded.

	SvVT (n=984)	SVT (n=485)	р
Hemolysis	6	8	0.05
Insufficient sample volume	71	44	0,21
Inappropriate sample volume	6	0	N/A
Clotted sample	6	0	N/A
TOTAL	89	52	0,3

Table 2: Distribution of error types in small volume and standard volume coagulation tubes (n=1469)

Results: 5531 tubes from 348 patients (SvVT:264;SVT:84) were examined. The rejection rate in SvVT was 4,5%; while it was 2,9% in SVT for EDTA containing tubes (Table 1). These rates were 9% and 11,5% respectively in coagulation tubes and 2,4% and 2% respectively in chemistry tubes (Table 2-3).

Noticeably; up to a difference of 10 g/dL were determined in HgV between consecutive two days and the study was suspended to investigate this problem.

	SvVT (n=1384)	SVT (n=633)	р
Hemolysis	18	6	0,46
Insufficient sample volume	11	5	0,99
Inappropriate sample volume	4	2	0,92
Clotted sample	0	0	N/A
TOTAL	33	13	0,65

Table 3: Distribution of error types in small volume and standard volume chemistry tubes (n=2017).

Discussion:SvVT have been found effective in reducing iatrogenic anemia prevalance in ICUp. We focused on pre-analytical laboratory errors associated with SvVT in this preliminary study and observe that there were no significant differences between the SvVT ve SVT in terms of rejection rates and rejection types.

When we investigated the reason of inconsistency in consecutive hemoglobin values, we witnessed improper phlebotomy techniques and determined nurses' avoidance of using evacuated blood collection tubes in ICUp. We provided education sessions to nurses before our main study.

Conclusion: We observed that; correct phlebotomy techniques and improving nurses' phlebotomy skills gain more importance in the use of SvVT, probably because of difficulty in optimizing the blood volume.

51AP05-2 ICU tales: the bumpy road from airway chaos to hospital discharge

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Background: Tracheostomy is often required in critically ill patients, especially following extensive head and neck surgeries, to secure the airway and facilitate ventilation. Complications such as tube obstruction and malposition can arise, necessitating a multidisciplinary approach for effective management.

Case Report: A 61-year-old male underwent anterior pelviglossectomy with marginal mandibulectomy and bilateral neck dissection, reconstructed with a free forearm flap. An intraoperative tracheostomy was performed. On postoperative day one, a tracheostomy tube obstruction led to patient distress and self-removal of the tube, causing wound dehiscence and false passages in the trachea during attempted reinsertion. Immediate stabilization involved intubation via bronchoscopy through the tracheostomy stoma, albeit with initial right main bronchus placement. causing left lung atelectasis.

Subsequent management included wound revision, bronchoscopic clearance and adjustment of the airway devices. On day nine, the orotracheal tube was exchanged for a laryngectomy tube using a Frova introducer with bronchoscopy support through the tube. Later, the tracheal tube was replaced with a fenestrated tracheostomy tube (8.0) with pneumology support, who performed bronchoscopy for direct visualization. The patient was subsequently weaned from mechanical ventilation, transferred to the surgical ward, and discharged without further complications. Discussion: This case highlights the complexities involved in managing the airway after tracheostomy, such as tube obstruction, false tract formation, and malposition.(1) Bronchoscopic guidance ensured accurate airway device placement and minimized further trauma. The Frova introducer proved invaluable in navigating compromised airways. Multidisciplinary collaboration was critical for successful resolution and highlights best practices for tracheostomy care in complex surgical cases.(2)

- 1. Morris, L. et al. Critical Care Nurse, 2013
- 2. Rosero, E. et al, Anesthesia & Analgesia 132(4):p 1003-1011 Learning points:
- 1. Patients with a tracheostomy in a ward environment need special standardized care.
- 2. False tract formation during tracheostomy tube reinsertion underscores the need for immediate bronchoscopy to guide repositioning.
- 3. A multidisciplinary approach ensures optimal outcomes in managing complex airway complications.
- 4. The timing of the interface changes was fundamental to the positive outcome of the patient.

51AP05-3

The effect of NRF2 on the attenuation of biotrauma in ventilator-induced lung injury

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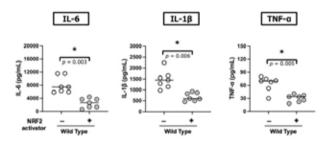
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Background and Goal of Study: To prevent ventilator-induced lung injury (VILI), it is important to attenuate biotrauma, an inflammatory response induced by alveolar hyperextension, and repeated collapse and re-expansion. NRF2 is an important transcription factor responsible for biological defense against stress responses due to the induction of antioxidant proteins, detoxifying enzymes, and glutathione synthase and suppression of the expression of inflammatory cytokines. We hypothesised that the administration of NRF2 activators would reduce biotrauma in a VILI rat model.

Materials and Methods: We created a two-hit VILI rat model by intratracheally administration of LPS (100 ng/kg), followed by a 210-min high tidal volume ventilation (20 mL/kg) after 24 h. Rats were intraperitoneally administered an NRF2 activator or PBS during LPS administration and upon mechanical ventilation (treatment and control groups). After 210 min of mechanical ventilation, the rats were euthanised by whole blood collection. Histological examination of the lungs was performed based on alveolar wall thickening, haemorrhage, and neutrophil infiltration into the alveoli, and the modified VILI score was calculated. The wet-to-dry lung ratio was used as a pulmonary permeability marker. The concentrations of inflammatory cytokines (IL-6, TNF- α , IL-1 β) in plasma and alveolar lavage fluid (BALF) were measured. All experimental protocols were approved by the Animal Care Committee of To-hoku University School of Medicine (2023-018-01)

Results and Discussion: NRF2 activators significantly reduced the modified VILI score on histological examination and wet-to-dry lung weight ratio. The concentration of IL-6, IL-1 β , and TNF- α in BALF significantly decreased in the treatment group compared to the control group (Figure 1). The concentration of IL-6 and IL-1 β in plasma also significantly decreased in the treatment group.

Figure 1. The concentration of IL-6, IL-1 β and TNF- α in BALF of VILI model rats



Conclusion(s): High tidal volume ventilation following LPS intratracheal administration induced strong lung injury; however, biotrauma was alleviated by NRF2 activator administration, suggesting NRF2 as a potential therapeutic target of VILI.

51AP05-4

Indirect calorimetry reveals malnutrition in an ICU-patient with super-refractory status epilepticus

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Background: Although nutrition is a crucial component of intensive care therapy, it underlies uncertainties. This may result in an unrecognized malnutrition or even starvation.

Ensuring adequate caloric provision for a patient with super-refractory status epilepticus over weeks is such a particularly challenging situation, in which indirect calorimetry can provide valuable assistance.

Case Report: A 42-year-old male with Crohn's disease presented with acute disorientation, imaging showed a stroke in the right posterior cerebral artery territory. Generalized tonic-clonic seizures followed, requiring ICU admission due to refractory focal seizures. The patient had a weight of 64.5 kg, a height of 175 cm, and a BMI of 21.1. Initial caloric requirements were calculated at 1,550 kcal/day, increased to 1,700 kcal/day to account for heightened demand.

Despite adjustments, he lost 12.5 kg over 7 weeks. Indirect calorimetry revealed an actual caloric deficit of 400 kcal/day, prompting further adjustments that halted weight loss. Three indirect calorimetry measurements were conducted. On day 49, his resting energy expenditure (REE) was 1,956 kcal/day at a RASS score of -2. With no movement (RASS -4), REE dropped to 1,670 kcal/day. During weaning (RASS -1), REE rose to 2,155 kcal/day.

Persistent seizures led to the implantation of a vagus nerve stimulator (VNS). Twenty-three days post-implantation, under multimodal antiepileptic therapy, seizures ceased. The status epilepticus lasted 77 days. The patient was discharged without further seizures

Discussion: Malnutrition during an intensive care stay is a high risk in patients presenting conditions with high caloric consumption, such as persistent focal status epilepticus. We revealed malnutrition over weeks by application of indirect calorimetry and a nutritional deficit of more than 25% of assumed need. We recommend early and regular use of calorimetry in such cases.

Reference:

1. ESPEN - Guidelines

Pironi, L. et al. (2023) 'ESPEN guideline on chronic intestinal failure in adults – Update 2023', *Clinical Nutrition*, 42(10), pp. 1940–2021. Available at: https://doi.org/10.1016/j. clnu.2023.07.019.

Learning points: Especially in patients with complex conditions like a super-refractory status epilepticus nutrition with simple weight-based equations may lead to malnutrition. In such cases, indirect calorimetry can provide a valuable asset to ensure adequate caloric provision.

51AP05-5

Comparison between surgical and percutaneous dilatational tracheostomy and their effect on mortality of patients in Intensive care unit: a retrospective study

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Background and Goal of Study: Tracheostomy is well defined and acknowledged technique which is essential in the process of weaning from mechanical ventilation and clinical outcome for patients treated in the ICU.Surgical tracheostomy(ST) is done by otorhinolaryngologist while percutaneous dilatational tracheostomy(PDT) is performed by a trained anesthesiologist and intensive care specialist.Our goal was to compare the effects of both types of tracheostomy on time needed for the patient to be

weaned from respirator and their mortality after 30 days. We took into account the period in which tracheostomy was done(early if it was before the 10th day of intubation, and late if it was after). We didn't focus on other factors because our patients were admitted to ICU and treated by mechanical ventilation for various reasons. We aimed to establish a positive connection between percutaneous tracheostomy and an early weaning period(defined as a period of 2 days from tracheostomy).

Materials and Methods: Our retrospective study was done on all the ICU patients that were tracheostomised in the period of two years. We did a bivariate analysis and compared two types of tracheostomy, time of tracheostomy, subsequent weaning period and one month mortality.

Results and Discussion: Total of 94 patients were tracheostomized,58 (62%) of which were being done by percutaneous dilatational tracheostomy, and 36 (38%) by surgical tracheostomy. Late tracheostomies were done on 57 patients (61%), and early ones on 37 patients (39%). There were 30 (32%) patients who were weaned early and 64 (68%) patients were weaned late, after 2 days from tracheostomy. Overall one month mortality was 11%. Percutaneous tracheostomy positively related to earlier weaning time (p 0.05, r 0.211, 64%). Surgical tracheostomy was associated with a higher mortality rate (p 0,01, r 0,296, 14% of all ST compared to 4% of all PDT). Late tracheostomy (done after the 10th day of intubation) was also associated with a higher mortality, independent of the type of tracheostomy (p 0,05, r 0,207, 90%).

Conclusion(s): Results of our study indicate that percutaneous tracheostomy is associated with earlier weaning period and lower mortality rate. Late tracheostomy is associated with higher mortality rate no matter the type of tracheostomy. Various comorbidities could also be included in the future study to determine stronger connection between tracheostomy, mechanical ventilation time and clinical outcome for patients treated in the ICU.

51AP05-6 Von Willebrand's late-life surprise in the ICU!

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Background: One of the most common inherited bleeding disorder is Von Willebrand Disease (VWD) and 1% of the population is

The cause of vWD is deffected or defficient von Willebrand factor (vWF), a protein which has a role in blood coagulation. It is VWD classified in 3 types. Type 1 and 3 defines quantitative deficiency and type 2 qualitative disorder.

Case Report: After evacuation of acute subdural hematoma, a 69-years old male was admitted in ICU. Control CT-scan showed a satisfactory result and he was weaned from ventilator. He was presented with left-sided hemiparesis. After 2 days he became agitated with reduced responsiveness. An urgent CT scan showed epidural hematoma. He was reoperated. In his past medical documentation we found about his previous abnormal bleeding, potential spondilopathy and elevated levels of M-protein which indicate myelodisplastic syndrome. Diagnosis showed reduced vWF levels (0.26), normal prothrombin time (PT) and activated partial thromboplastin time (aPTT). A treatment with vWF concentrate was started in initial dose of 50 IU/kg, followed with 25 IU/kg every 12 hours until hemostasis was achieved along with intravenous tranexamic acid. Levels of vWF and factor VIII were monitored. After 8 days, a follow-up CT scan showed satisfactory findings, and patient was weaned from respirator. He was alert, oriented and left with mild residual left-sided hemiparesis and was discharged to the neurosurgery.

Discussion: Diagnose of VWD in ICU can be challenging, as tests like PT and aPTT often fail to reflect disease severity. Our patient was 69-year old when he was diagnosed with vWD. Management of VWD in the ICU demands a multifaceted approach. It includes hemostatic therapies like desmopressin (DDAVP) or vWF concentrates (Wilate) for more severe cases. Antifibrinolytics are essential for controlling mucosal bleeding, a common complication in VWD. Blood product support, including red blood cell or platelet transfusions, is often required. It is necessary to collaborate with hematologists to optimize therapy and minimize complications.

Learning points:

- 1. VWD in the ICU presents significant challenge due to interaction with critical illnesses and coagulopathies.
- 2. Early diagnosis, targeted therapy, and a multidisciplinary approach are important in reducing bleeding risks and improving outcomes.
- 3. Balancing effective hemostasis with minimizing thromboembolic risks remains a key aspect of care for these vulnerable patients.

51AP05-7 TUR syndrome isn't dead

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Background: Transurethral resection (TUR) syndrome is characterized by hyponatremia and volume overload following TUR surgery. Depending on the severity of the electrolyte imbalance, clinical manifestations can go from mild to severe neurological symptoms and acute volume overload clinic. The use of bipolar electrosurgical devices that are compatible with electrolytecontaining irrigation solutions came to reduce the incidence TUR syndrome but not to obliviate it.

Case Report: A 72 years old male patient was admitted in the ICU due to respiratory insufficiency related to sudden onset pulmonary edema with the need of noninvasive ventilation.

Previous medical history included arterial hypertension, ischemic cardiomyopathy with midrange LVEF, type 2 diabetes mellitus and a previous smoking history.

Three days before, he was admitted in the hospital for an elective bladder TUR due to hematuria related to papillary bladder lesions. A general anesthesia was performed, and the procedure went uneventful. In the postoperatory period, the patient reported some visual alterations, confusion and

tinnitus that were interpretated as hallucinosis. Two days after surgery, the patient developed acute dyspnea with SpO2 88% in room air, confusion, tachycardia and hypertension. The first BGA revealed a type 1 respiratory insufficiency and a severe hyponatremia of 106 mEq/L (confirmed by laboratory tests).

The patient was admitted in the ICU where continuous monitoring, diuretic therapy and ventilatory support with noninvasive ventilation were provided and clinical improvement was achieved. Revisiting the history, the clinical suspicion of hyponatremia with fluid overload related to the transurethral resection of the bladder was made. Although confirmed the use of

bipolar surgery device and an electrolyte- containing irrigation solute, the volume of saline solution was unknown and with no other cause identified. TUR syndrome was assumed as the most likely hypothesis.

The patient had an overall improvement with no sequelae left and was discharged from the ICU within 24h and from the hospital within three days.

Discussion: Hyponatremia following TUR surgery is an increasingly uncommon condition with the use of new surgical techniques and devices. However, the risk is still real and a low threshold of suspicion is required, otherwise serious clinical conditions may go unnoticed.

Learning Points: TUR syndrome is a rare entity nowadays but is not extinguished.

51AP05-8 Successful management of a highly allosensitized heart transplant recipient

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Background: Allosensitization, marked by elevated pre-transplant anti-HLA antibodies, is linked to longer waitlist times and increased risk of graft dysfunction or rejection. Sensitization can occur due to prior pregnancy, blood transfusion, or organ transplantation. Desensitization protocols, targeting various immune components, are mainly based on kidney transplant regimens, but no consensus exists on the optimal approach for cardiac transplant patients.

Case Report: A 49-year-old woman developed end-stage chemotherapy-induced cardiomyopathy. Due to recent malignancy, transplantation was initially contraindicated, and a ventricular assist device was implanted as bridge-to-transplant therapy. The procedure was complicated by severe bleeding, requiring a massive transfusion. After five years of complete remission, the patient was eligible for waitlist registration. The pre-transplant evaluation revealed elevated anti-HLA antibody levels. It took three years for a compatible donor to be matched. A preoperative desensitization protocol strategy included immunoadsorption for antibody removal and rituximab administration. During the transplantation, severe initial graft dysfunction required the implantation of an extracorporeal membrane oxygenator. Postoperatively, standard immunosuppressive therapy (anti-thymocyte globulin, methylprednisolone, mycophenolate mofetil, tacrolimus) was introduced. Nine additional immunoadsorption sessions were required, along with eculizumab and intravenous immunoglobulins, until anti-HLA antibody titers decreased to acceptable levels and cardiac function improved. The patient was discharged on postoperative day 18 with normal graft function. A subsequent myocardial biopsy showed insignificant cellular and humoral rejection. Discussion: There are no large-scale studies to guide desensitization protocols for heart transplant candidates and small-scale studies show variable efficacy. This case contributes valuable insights into the evolving field of desensitization protocols for heart transplant patients.

References:

1. DeFilippis EM, Kransdorf EP, Jaiswal A, et al. Detection and management of HLA sensitization in heart transplant candidates. J Heart Lung Transplant, 2023 Apr:42(4):409-422.

Learning Points: Multimodal desensitization strategies in highly sensitized solid organ transplant recipients has been shown to improve outcomes. Further research and standardization of protocols in cardiac transplant patients are necessary.

51AP05-9

Bioelectrical impedance analysis, fluid balance, and Capillary Leak Index in critically ill patients

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Background: Fluid management is crucial in critically ill patients. Bioelectrical Impedance Analysis (BIA) measures Total Body Water (TBW), Intracellular Water (ICW), and Extracellular Water (ECW). The Capillary Leak Index (CLI), derived from CRP and albumin, reflects endothelial permeability. This study examines their relationship with fluid balance.

Materials and Methods: 15 critically ill patients were included with 62 BIA measurements over three days. BIA metrics were obtained at the bedside, and cumulative fluid balances were retrieved from electronic health records. CLI and BIA parameters were analyzed using Spearman's rank correlation.

Results and Discussion: Significant correlations were found between CLI and both TBW ([] = 0.431, p < 0.001) and ECW ([] = 0.435, p < 0.001), indicating that higher CLI values are associated with extracellular fluid accumulation. CLI did not significantly correlate with the ECW/ICW ratio (□ = 0.089, p = 0.489) or ECW percentage (\square = 0.089, p = 0.489).

Cumulative Net Fluid Balance, recorded since ICU admission, positively correlated with TBW (\square = 0.506, p < 0.001), ICW (\square = 0.442, p < 0.001), and ECW (\square = 0.495, p < 0.001). Delta changes in cumulative fluid balance and body water compartments showed weak, non-significant correlations, likely due to the challenges of detecting short-term fluid shifts with BIA or limitations in fluid balance data accuracy.

Parameter	Spearman's ρ	p-value
1. TBW (L)	0.431	<0.001
2. ECW (L)	0.435	< 0.001
3. ECW (%)	0.089	0.489
4. ECW/ICW Ratio	0.089	0.489
5. TBW (L)	0.506	< 0.001
6. ICW (L)	0.442	< 0.001
7 FCW(L)	0 495	<0.001

Table A: Correlation Capillary Leak Index (CLI) and BIA-Derived Metrics (1 - 4), Correlation Cumulative Fluid Balance and BIA Metrics (5 - 7)

CLI is calculated as (CRP [mg/dL] / Albumin [g/L]) × 100; - Cumulative fluid balance represents total intake minus total output recorded since ICU admission.

Conclusion(s): BIA-derived parameters, including TBW, ICW, and ECW, correlated with cumulative fluid balance, confirming their role in assessing fluid status and extracellular shifts in critically ill patients. Associations with CLI highlight BIA's ability to capture systemic fluid changes linked to endothelial dysfunction. However, weaker correlations for changes in fluid balance and body water compartments reflect the complexity of short-term fluid dynamics. Unlike previous BIA studies, this research integrates CLI to enhance understanding of fluid shifts and systemic inflammation, offering new insights into fluid management and endothelial permeability in critical care.

51AP05-10

Critical care victory: saving a life from multi-organ failure in a life-threatening case of thrombothic thrombocytopenic purpura (TTP)

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Background: TTP is a clinical condition identified by microangiopathic hemolytic anemia, thrombocytopenia, neurological symptoms, often fatal outcome(1). TTP is a medical emergency. If treatment is not initiated rapidly, it leads to mortality.

Case Report: A 40-year-old female patient presented to the emergency department with fever, nausea-vomiting, diarrhea onset 3 days ago. She had no chronic diseases. She was somnolent. Widespread petechial rashes were on her body. Lab tests showed anemia, thrombocytopenia, hyperbilirubinemia, elevated liver enzymes and creatinine. Coagulation tests, fibrinogen levels were normal. The patient was in multi-organ failure, and admitted to the ICU. Further lab results showed reticulocytosis, low haptoglobin, negative direct Coombs test, schizocytes on peripheral smear. Intravascular hemolysis was diagnosed. ADAMTS-13 activity test was ordered. Simultaneously, rituximab, pulse steroids, plasmapheresis (PEX) (twice daily) were started. On the 3rd day, she was comatose, and intubated. Cranial imaging was normal. Vasopressors were started for shock. On the 6th day, hemodialysis was started for acidosis. ADAMTS-13 activity <5%, confirming TTP. On the 10th day, caplacizumab could only be administered in 3 doses. Then, hemodynamic and metabolic parameters began to improve. She was extubated on the 20th day. Meanwhile, a catheter-associated infection was detected, treatment was adjusted. Later, massive lower rectal bleeding occurred. Rectoscopy revealed a rectal ulcer. Sclerotherapy failed. The superior rectal artery was embolized angiographically. On the 25th day, the patient developed thrombocytopenia again. Resistance was suspected. Splenectomy was performed. After a month of ICU, she was discharged without sequelae.

Discussion: Infectious, autoimmune causes can lead to TTP. Organ failures may occur together due to hemolysis and microthrombi causing tissue ischemia. Coma and cardiac affection indicate poor prognosis(1). Rituximab, PEX, corticosteroids may be useful in treatment. In resistant cases, caplacizumab can be life-saving(1).

References:

1. Scully, M. et al. A British Society for Haematology Guideline: Diagnosis and management of thrombotic thrombocytopenic purpura and thrombotic microangiopathies. Br J Haematol 203, (2023).

Learning Points: TTP is an acute clinical condition with up to 90% mortality. The management of this complex process can challenge clinicians. Correct treatment can save lives, even in severe cases.

51AP05-11

Thorax volume of ARDS patients elevated by mechanical ventilation

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Background and Goal of Study: The diseased lung loses compliance, reducing lung volume and pleural pressure (Por more negative than the standard P_{a}). Several authors [i]. [ii] report high positive P_{nl} in mechanically ventilated (MV) ARDS patients. Positive P_{nl} is indicative of a high thoracic volume ($V_{\it thor}$) because the transthoracic pressure equals P_{pl} , V_{thor} is increased by the product of P_{pl} and thoracic wall compliance (Table 1). Therefore: V_{thor} increases during MV in ARDS patients.

Materials and Methods:

Author	Series	N	TV	EE Ppl	El Ppl	PEEP	Plateau	Compliance	Extra V>FRC
Talmor	Pes guided (base)	30	484	17.2	21.2	14.0	29	121	2807
	Conventional (base)	30	491	16.9	20.7	15.0	29	129	2959
	Pes guided (72 h)	30	472	18.4	21.7	18.0	28	143	3490
	Conventional (72 h)	30	418	14.3	17.9	12.0	25	116	2357
Beitler Pes guided	Pes guided	102	396	16.0	19.0	14.0	28	132	2905
	Emperical PEEP	98	362	15.0	18.0	12.5	27	121	2531
Kassis	Day 1	40	360	13.7	16.1	13.5	25	150	2955
	Day 3	38	390	13.0	15.9	13.0	24	134	2546
	1 week	35	380	12.1	15.8	13.0	25.5	103	1864

Table 1. Pleural pressure (Pes) measurements in mechanically ventilated ARDS patients.

Results and Discussion: Alveolar pressure in the end-expiratory conditions for ARDS patients must be at least P_{nl} +6 cmH₂O. Talmor[i] reports an end-expiratory P_{pl} of 17.2 cmH₂O (first row of Table 1), so alveolar pressure of 23 cmH₂O. Airway pressure equals PEEP at 14 cmH₂O, indicating complete airway closure. This finding is consistent across all rows in Table 1.

Hypothesized mechanism.

- · At the initiation of MV, expiratory volume is smaller than inspiratory tidal volume, leading to an increase in V_{thor} and P_{ol} .
- Driving expiration pressure rises.
- Equilibrium when expiratory volume equals inspiratory volume. Imaging studies (X-ray and CT scans) show that the V_{thor} increase is significantly due to edema. This edema may result from the altered hydrostatic component in the Starling equation.

Normally, airway pressure exceeds P_{nl} throughout the respiratory cycle. In MV-ARDS patients, however, mean P_{nl} often exceeds mean airway pressure, reversing this gradient and causing fluid to move from the pleural space into the lungs.

Conclusion(s): Clinical studies have shown that lowering tidal volume reduces mortality in ARDS patients. This can be explained by the fact that lungs are forcibly pressed against the thoracic wall during MV, stressing the underlying parenchyma.

The extent of this stress is proportional to the lung expansion, tidal volume.

The abundance of edema in the thorax aligns with the altered direction of the hydrostatic component in the Starling equation.

References:

- i. Talmor D et al. N Engl J Med 2008;359:2095-104.
- ii. Beitler JR et al. JAMA. 2019:321(9):846-857.
- iii. Kassis EB et al. Journal of Critical Care 63 (2021) 106-112.

51AP05-12

Gavet-Wernicke encephalopathy following caustic ingestion: a case report from the surgical

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Background: Gayet-Wernicke encephalopathy (GWE) is a neurological emergency caused by thiamine deficiency. Although rare, with a prevalence of 1.3%, it is often underdiagnosed, especially in high-risk populations such as elderly, malnourished, or polymorbid patients with gastrointestinal or renal disorders. Magnetic resonance imaging (MRI) is the key diagnostic tool, revealing specific thiamine deficiency lesions. Prompt recognition and treatment are critical to prevent progression to Korsakoff syndrome, coma, or death. This case illustrates the clinical and radiological presentation of GWE and emphasizes the importance of early

Case Report: A 63-year-old man was admitted to the surgical ICU with altered mental status following a two-month hospitalization for caustic ingestion. His clinical course was complicated by chronic vomiting, leading to apyretic encephalopathy. On examination, the patient was cachectic, hypothermic, and had a Glasgow Coma Scale score of 13/15. Oculomotor evaluation revealed nystagmus.Laboratory findings showed hypoalbuminemia (20 mg/L) and hypokalemia (3 mmol/L).Brain MRI revealed T2 hyperintensities in the periventricular regions of the thalamus, mammillary bodies, and floor of the fourth ventricle, consistent with GWE.

Discussion: Gayet-Wernicke encephalopathy is frequently overlooked due to its non-specific symptoms and varied presentations, particularly in malnourished surgical patients. MRI findings are critical for diagnosis, as the lesions identified are pathognomonic for thiamine deficiency(1). Chronic vomiting and nutritional deficiencies are common risk factors in surgical settings(2). Immediate administration of thiamine is the cornerstone of treatment and should ideally begin within 48-72 hours of symptom onset to reverse the condition and prevent irreversible seguelae(3). Delayed diagnosis or treatment can lead to permanent cognitive impairments or death, emphasizing the need for heightened awareness in at-risk populations.

References:

- 1. Zuccoli, G., et al. (2007).MR imaging findings in 56 patients with Wernicke encephalopathy: Nonalcoholic patients may differ from alcoholic patients. AJNR Am J Neuroradiol, 28(7)
- 2. Sechi, G., & Serra, A. (2007). Wernicke's encephalopathy: New clinical settings and recent advances in diagnosis and management. Lancet Neurol, 6(5)
- 3. Harper, C. G., et al. (1986). Wernicke's encephalopathy: A more common disease than realised. Journal of Neurology, Neurosurgery & Psychiatry, 49(4)

51AP06-1

Recurrent paroxysmal sympathetic hyperactivity following hypoxic brain injury after cardiac arrest: a case report

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Background: Paroxysmal sympathetic hyperactivity (PSH) is a syndrome characterized by paroxysmal, transient increases in sympathetic activity and motor (posturing) activity following acquired brain injury (ABI). Early diagnosis is challenging but equally

Case Report: A 31-year-old man was admitted to our intensive care unit following a cardiac arrest associated with pregabalin and unknown drugs. CT on admission showed acute infarct and edema in the periventricular white matter, caudate nucleus. and basal ganglia. During sedation cessations, he experienced tachycardia, tachypnea, and hypertension. He was extubated on the 10th day of admission while receiving dexmedetomidine infusion. He was sedated for tonic seizures and treated for aspiration pneumonia-related sepsis. However, despite negative infectious findings, the patient developed fever, tachycardia, hypertension, diaphoresis, extensor posturing, and diarrhea during respiratory therapy. He was subsequently re-intubated and sedated. EEG evaluated as normal. Upon cessation of sedation, the same sympathetic features reappeared. A diagnosis of paroxysmal sympathetic hyperactivity (PSH) was made with a PSH assessment score of 24. Following the administration of propranolol and clonazepam, the patient was extubated on the 14th day, with a Glasgow Coma Scale of 15 and cognitive impairments. Baclofen was initiated for chronic muscle contractions. Two weeks later, symptoms recurred with a PSH score of 18, prompting a revision of medications. No new episodes occurred during the 90-day follow-up.

Discussion: PSH is indicative of disease severity but does not affect prognosis. Early diagnosis remains challenging. However, understanding the risk factors and considering them in the differential diagnosis can lead to earlier recognition, potentially reducing the duration of mechanical ventilation, hospital stay, and related complications.

References:

- 1. Baguley, Ian J., et al." Paroxysmal sympathetic hyperactivity after acquired brain injury: consensus on conceptual definition, nomenclature, and diagnostic criteria." Journal of neurotrauma31.17 (2014):1515-1520.
- 2. Xu SY, Zhang Q, Li CX. Paroxysmal Sympathetic Hyperactivity After Acquired Brain Injury: An Integrative Review of Diagnostic and Management Challenges. Neurol Ther. Şubat 2024;13(1):11-20.

Learning Points: Due to overlapping clinical presentations, PSH should be considered in cases of fever, shivering, and tachycardia, especially along with brain injury.

51AP06-2

When skin and system fail: a critical care perspective on Stevens-Johnson syndrome

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Background: Stevens-Johnson Syndrome (SJS) are severe mucocutaneous reactions, with high mortality in systemic cases. Survivors may have long-term sequelae affecting quality of life. Case Report: A 22-year-old female with type 1 diabetes presented with fever and rash lasting 2 weeks. She had been prescribed levetiracetam for suspected seizures 5 months prior, but developed widespread skin rashes, prompting a switch to valproate. Over the last two weeks, the rash worsened. She had been receiving intravenous piperacillin-tazobactam for 4 days for a urinary tract infection. Physical examination revealed an obese, icteric patient with widespread truncal skin rashes, hepatosplenomegaly, oral erosions with seborrheic crusts around the lips. Lab results showed leukocytosis, eosinopenia, elevated liver enzymes, hyperglycemia, ketonuria. She was admitted to the ICU, treatment for diabetic ketoacidosis and infection began. On day 2, she developed somnolence and hypoxemia, refusing oral intake due to painful oral lesions. EEG showed no epileptic activity. Drug reaction was suspected. Valproate was discontinued. All tests for autoantibodies and infections were negative. Skin biopsy confirmed SJS. Plasmapheresis (PEX) and corticosteroid therapy were initiated. On day 5, the patient developed ARDS, was intubated, and later had acute kidney injury and cardiogenic shock, requiring hemodiafiltration and vasopressors. Despite aggressive treatment, she died on day 14 from multi-organ failure.



Discussion: SJS has a 22% mortality rate. The skin barrier disruption causes fluid loss, thermoregulation issues, hemodynamic instability. Complications include pancytopenia, sepsis, acute liver failure, acute kidney injury, multi-organ failure. Corticosteroids, cyclosporine, PEX may enhance outcomes(1).

References:

1. Creamer, D. et al. UK guidelines for the management of Stevens-Johnson syndrome/toxic epidermal necrolysis in adults 2016. Journal of Plastic, Reconstructive and Aesthetic Surgery

Learning points: SJS requires a multidisciplinary approach and can be fatal if untreated. Long-term sequelae like corneal scarring and airway strictures can severely affect life quality.

51AP06-3

Bacteremia in the intensive care unit. Incidence and antimicrobial resistance in critical ill patients

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Background and Goal of Study: Bloodstream infections (BSIs) remain a significant cause of morbidity and mortality in intensive care units (ICUs) worldwide. Studies estimate that the incidence of BSIs in ICUs ranges from 5 to 25 cases per 1,000 patient-days, depending on the region and healthcare setting. Timely and targeted antimicrobial therapy is essential for improving survival rates and reducing complications associated with BSIs.

In this study, we aimed to evaluate the incidence of positive bacterial blood cultures in the ICU of a hospital in Puebla, Mexico, and to analyze the antibiotic resistance profiles of these isolates.

Materials and Methods: This retrospective observational study was conducted in the intensive care unit (ICU) of a hospital in Puebla, Mexico. We analyzed data from all positive blood cultures obtained from ICU patients during the study period from August 2023 to August 2024. A total of 742 blood cultures were collected from 248 patients. Upon identification of a positive blood culture, the isolated microorganism underwent further testing to determine its antimicrobial resistance profile.

Results and Discussion: A total of 742 positive blood cultures were analyzed from 248 patients in the intensive care unit (ICU). Antibiogram testing revealed a wide range of antibiotic resistance profiles among the isolates. 49 patients were male and 34 women. The age range of the patients in the study was from 20 to 86, with a mean age of 58.2 years. The analysis of 742 positive blood cultures identified a diverse array of microbial isolates, with Gram-positive organisms being the most frequently detected. Staphylococcus species accounted for the highest proportion, representing 27.71% of all isolates. Escherichia coli was the most common Gram-negative isolate, comprising 24.10% of the total. The incidence of bacteremia in our study was 33%.

Our findings align with previous research showing that patients over the age of 55 years are more prone to develop bacteremia. The microbial spectrum in our ICU revealed a predominance of Staphylococcus species (27.71%) and Escherichia coli (24.10%), consistent with global trends where these pathogens are frequently implicated in BSIs.

Conclusion(s): These findings highlight the predominance of Staphylococcus and Escherichia coli in bloodstream infections within the ICU, underscoring the importance of targeted antimicrobial strategies to manage these common pathogens effectively.

51AP06-4

Exploring anemia in critically III patients: a retrospective observational analysis

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Background and Goal of Study: Anemia is a frequent and multifactorial complication in critically ill patients, contributing to an increase in blood transfusions. This study aims to explore the type of anemia on admission as well as the type of anemia which arises during hospitalization.

Materials and Methods: This retrospective observational study included a number of 38 critically ill patients admitted to ICU for non-surgical pathologies. Two cohorts were defined: patients presenting with anemia on admission and non-anemic patients. but who developed anemia during hospitalisation. Anemia was defined as Hb < 13 g/dL in males and <12 g/dL in females.

Results and Discussion: 11 (29%) patients were diagnosed with anemia on admission and a further 19 (50%) developed anemia after admission. On admission, anemic patients exhibited a mean hepcidin level of 207.9 ng/mL, ferritin of 998 ng/mL and C-reactive protein of 8.8 mg/dL.

These findings suggests that inflammatory anemia is dominant in critically ill patients where inflammation induces hepcidin upregulation and iron trapping in the form of ferritin.

Conclusion(s): This study highlights the type of anemia in critically ill patients where iron metabolism is dysregulated by inflammation. These patients do not benefit from iron administration for the treatment of anemia.

Most often patients are transfused as means of treatment. Efforts in ICU should focus on strategies to reduce unnecessary blood loss such as frequent blood sampling. Monitoring hepcidin may offer valuable insights for timely interventions and improved management of anemia in critically ill patients.

These results indicate the need for future research exploring targeted therapies for iron metabolism disturbances in critically ill patients.

51AP06-5 Vertebral Artery Dissection: a leading cause of stroke in young patients

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Background: The overall incidence of vertebral artery dissection (VAD) is approximately 1-1.5 per100,000, but VAD is a leading cause of stroke in young patients. It is usually associated with neck distortion caused by chiropractic manipulation, bending of the neck, or blunt trauma, although it can also occur spontaneously (1,2).

Case Report: A 30-year-old man was admitted to the emergency department with headache, nausea, and dizziness half an hour after he had self-manipulated his neck. The initial computed tomography angiography (CTA) was assessed as normal, but he was intubated due to the Glasgow Coma Scale(GCS) score worsening and transported to our hospital.

Control CTA revealed a right-sided vertebral artery dissection and Magnetic Resonance Imaging(MRI) showed a right-sided lateral medullary and cerebellar infarction. Anti-platelet and anticoagulant therapy was initiated in intensive care unit (ICU).

After extubation on the 4th hour of admission, he was found to have Wallenberg's Syndrome, which manifested as dysphonia, dysarthria, dysphagia, hiccups and hoarseness. The symptoms progressively diminished throughout the course of treatment.

On the day 5, only hoarseness and dysphagia continued to persist, albeit with an improvement compared to the initial presentation. Then, he transferred to the ward.

Discussion: Although rare, vertebral artery dissection should always be included in the differential diagnosis of nausea and dizziness and it should be kept in mind that activities such as cracking the neck, yoga, or painting the ceiling could lead to this condition.

Additionally, even if the initial imaging results are normal, if there is clinical suspicion, the imaging should be repeated.

References:

- 1. Park, Kwan-Woong, et al. "Vertebral artery dissection: natural history, clinical features and therapeutic considerations." Journal of Korean Neurosurgical Society 44.3 (2008): 109.
- 2. Albuquerque, Felipe C., et al. "Craniocervical arterial dissections as sequelae of chiropractic manipulation: patterns of injury and management." Journal of neurosurgery 115.6 (2011): 1197-1205.

Learning points: Even if the imaging results are normal, it should be repeated in the presence of clinical suspicion related to dissection and stroke.

51AP06-6

Post-surgical euglycemic diabetic ketoacidosis due to SGLT2i: a case report

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Background: Diabetic ketoacidosis is an endocrine emergency characterized by hyperglycemia, metabolic acidosis with an elevated anion gap, and ketosis. There is a group of patients with diabetic ketoacidosis who present normal blood glucose levels, known as euglycemic diabetic ketoacidosis (EDKA), which is defined by relative euglycemia (serum glucose <250 mg/dl) with metabolic acidosis (HCO3- <18 mEq/l and pH <7.3) and ketosis. The incidence of EDKA has increased in recent years with the use of sodium-glucose cotransporter-2 inhibitors (SGLT2i), which include canagliflozin, empagliflozin, and dapagliflozin.

Case Report: A 76-year-old woman needs to undergo urgent laparotomy for incarcerated right inguinal hernia under general anesthesia. Of note, the patient has no known allergies and has type 2 diabetes, being treated with Sinjardy (Metformin and Empagliflozin), which she took that morning.

After the surgery, the patient is hemodynamically stable and no symptoms. However, her lab results stand out: pH 7.12, pCO2 27 mmHg, pO2 107 mmHg, HCO3- 8.1 mmol/L, Base Excess: -19, Lactate level of 1.4, Anion Gap of 22, and Blood Glucose of 180 mg/dL. Also, ketone bodies are measured in the urine, which are elevated.

A central line is inserted for the administration of HCO3- and treatment is started with an insulin pump and 10% glucose solution, resulting in improvement of the condition, and the patient is able to be discharged after 6 days.

Discussion: SGLT2i act on the kidney increasing urinary glucose excretion and blocking glucose reabsorption. Thus, they are associated with EDKA due to reduced glucose availability and production during fasting in diabetic patients who have an underlying absolute or relative insulin deficiency with insulin resistance.

All of this, combined with a stressor such as surgery, leads to an increase in counterregulatory hormones like glucagon and contributes to the production of free fatty acids, which results in ketogenesis and acidosis.

Learning Points: The incidence of EDKA is increasing due to the emergence of medications such as SGLT2i. This condition should be considered in postoperative patients where the recommended discontinuation times for these drugs have not been followed.

Diagnostic tests include blood gas analysis with measurement of pH, bicarbonate, and ketone body determination. Treatment involves resuscitation with intravenous fluids, insulin, glucose, and addressing the underlying etiology.

51AP06-7

Humanisation in intensive care units: evaluation of basic good practices

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Background and Goal of Study: Advances in intensive care mean that more and more patients are surviving. However, the experience of patients and their families during their stay has been described as traumatic. In response to this situation, the HU-CI project¹ has been launched in Spain with the aim of promoting humanised care through the implementation of good practices divided into seven strategic lines².

This study aims to evaluate the implementation of good practices and to identify the deficient factors that contribute to the dehumanisation of the ICU.

Materials and Methods: A survey was designed for the study using the Google Forms tool. Only those good practices that were considered essential were included in the questionnaire. The survey was distributed to health professionals in intensive care units in Spain. The responses received were analysed to identify areas for improvement.

Results and Discussion: Responses from 29 centres were entered into an Excel database. Descriptive analysis of the data was performed using SPSS statistics. Significant deficiencies were found in the provision of continuing education, in the implementation of standardised protocols, especially in aspects such as the management of delirium, the involvement of families in care, and the prevention and management of post-intensive care syndrome (*Table*).

Conclusion(s): The study highlights the urgent need to implement continuous training programmes and standardised protocols. Although progress has been made, more training in non-technical skills, emotional support for staff, family involvement and addressing post-intensive care syndrome is essential.

GOOD PRACTICES	YES	NO
Continuous training in non-technical skills for the healthcare team is carried out to enable family presence and involvement.	19%	81%
There is a healthcare protocol available regarding family involvement in basic care (food, hygiene and moving) for critical patients.	24%	76%
Training activities are carried out on non-technical and relationship skills that include giving bad news, difficult situation and grief.	29%	71%
Training activities are carried out on understanding and managing stress, occupational burnout, as well as promoting engagement, emotional competences and psychosocial skills at work.	14%	86%
Newly incorporated staff: a welcome programme is offered to all ICU healthcare staff.	38%	62%
Training on end-of-life accompaniment with and grief support is provided to professionals involved in caring for patient/family.	33%	67%
There is a protocol in place to favour communication with patients who have difficulties to communicate.	14%	86%
There is an updated protocol on preventing and managing delirium.	48%	52%
There is an interprofessional protocol in place to prevent and deal with post intensive care syndrome for patients and families.	33%	67%

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51AP06-8

Establishment of the family school in the ICU: a new approach to understanding medicine based on humanization

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Background and Goal of Study: The illness in the critically ill patient causes a significant family crisis. As an excellent measure, the creation of the family school in the Intensive Care Unit (ICU) aims to integrate and involve family members in the care of the patient. This seeks to end the sense of helplessness that families experience, promoting their well-being. The main objective of this project is to enhance the care process for patients admitted to the ICU.

Materials and Methods: For the implementation of this project, two basic pillars are required:

- 1. Individual and family counseling. Identification and recruitment of primary caregivers.
- 2. Training program in skills and activities for the improvement of care and recovery. Theoretical sessions offered by the nursing team on topics of interest for family members (management of ostomies, positional changes for the prevention of pressure ulcers, aspiration of secretions through tracheostomy, etc.).

Results and Discussion: The results are very promising. 100% of family members find the training very useful and 100% of attendees would recommend it to other caregivers.

Conclusion(s):

- The unity of the team and the support from management is a guarantee for the successful functioning of the project.

- The family school has managed to reduce the stress and anxiety of the family members.
- The satisfaction and acceptance rate of the project is 100%. References:

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Acknowledgements: I would like to express my gratitude for the involvement and great professionalism of the entire multidisciplinary team working on humanization.

51AP06-9

Prospective evaluation of bioelectrical impedance analysis metrics and correlations with clinical parameters in critically ill patients

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Background and Goal of Study: Assessing fluid and cellular status is critical in managing critically ill patients, where traditional tools may not provide real-time insights. Bioelectrical Impedance Analysis (BIA) offers a non-invasive way to measure total body water (TBW), intracellular water (ICW), extracellular water (ECW), and phase angle, a marker of cellular integrity. This study evaluated the relationship between BIA-derived parameters, including phase angle, and clinical markers such as lactate, urea, and creatinine.

Materials and Methods: A prospective evaluation involved six critically ill patients over five days, with 50 BIA measurements using the InBody S10. Data on TBW, ICW, ECW, and phase angle were analyzed alongside clinical parameters from electronic records. Spearman's rank correlation assessed relationships between BIA metrics, lactate, urea, creatinine, and net fluid balance. Results and Discussion: Significant negative correlations were observed between serum lactate levels and TBW (Spearman's ρ = -0.541, p < 0.001), ICW (ρ = -0.536, p < 0.001), and ECW (ρ = -0.541, p < 0.001), indicating that elevated lactate levels were associated with reduced hydration. Phase angle also demonstrated a significant negative relationship with the urea-to-creatinine ratio (ρ = -0.475, p < 0.001), supporting its role as a marker of cellular health. Similar patterns were observed with urea, which correlated negatively with TBW (ρ = -0.429, p = 0.002), ICW (ρ = -0.428, p = 0.002), and ECW (ρ = -0.433, p = 0.002). Although net fluid balance did not correlate significantly with TBW or ICW, it was strongly associated with the ECW/TBW ratio (ρ = 0.671, p < 0.001).

Conclusion(s): This evaluation highlights the potential of BIA, including phase angle, in providing real-time insights into fluid and cellular status in critically ill patients. Elevated lactate, a marker of tissue hypoperfusion and metabolic stress, was associated with reduced hydration metrics, emphasizing the importance of monitoring fluid status. The urea-to-creatinine ratio, a marker of kidney function and protein breakdown, was negatively correlated with BIA parameters, reflecting hydration and cellular health changes linked to kidney dysfunction. Phase angle offered additional insights by associating fluid balance with cellular integrity and overall patient condition. Further research is needed to validate these correlations and assess their prognostic value.

51AP06-10

The efficacy of ceftazidime/avibactam combination therapy vs. colistin/polymyxin B in critically ill patients: A systematic review and meta-analysis

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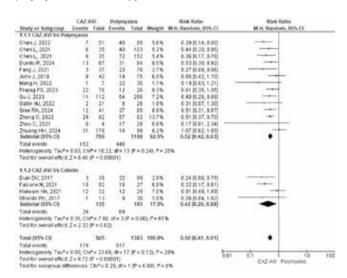
Background: Ceftazidime/avibactam (CAZ-AVI) and Colistin/polymyxin B-based therapy are current treatment options for critically ill patients with sepsis; however, few studies have contrasted the relative efficacy of the two antibiotics regimens.

We aimed to compare the clinical efficacy and safety of CAZ-AVI therapy in combination with other antibiotics and Colistin/polymyxin-based therapy (either alone or in combination with other antibacterial drugs) in treating sepsis.

Materials and Methods: Electronic databases including PubMed, MEDLINE, Embase, and the Cochrane Library were searched from January 2017 to December 2024 using the following search terms: "Ceftazidime/avibactam" AND ("polymyxin B" OR "Colistimethate" OR "Colistin") AND ("Sepsis" OR "Pneumonia" OR "VAP" OR "Bloodstream Infection").

Prospective and retrospective cohort studies comparing ICU mortality, clinical success, bacterial eradication, and adverse complications after the use of CAZ-AVI and polymyxins in critically ill patients were included. Risk ratio (RR) was used as the effect size for evaluating outcomes, using the generic inverse variance method and random effects meta analysis.

Results and discussion: Eighteen studies with 2308 patients were included (CAZ-AVI: 925, polymyxins: 1383). The pooled data showed that in patients treated with CAZ-AVI therapy had significantly lower risk of mortality [Risk ratio (RR) 0.50; 95% Confidence Interval (CI): 0.41, 0.61; I² = 29%; p < 0.00001], better clinical improvement [RR 1.82; 95% CI: 1.45, 2.29; I² = 65%; p < 0.00001], better bacterial eradication[RR 2.20; 95% Cl: 1.57, 3.07; $I^2 = 80\%$; p < 0.00001], lower risk of acute kidney injury [RR 0.46; 95% CI: 0.30, 0.71; $I^2 = 7\%$; p = 0.0005) than patients treated with polymyxin-based therapy.



Conclusion: Ceftazidime/avibactam combination therapy has a superior clinical efficacy in treating sepsis, in terms of better bacterial eradication, clinical improvement, lesser acute kidney injury, and lower risk of ICU mortality compared to Colistin/polymvxin B.

51AP06-11

postoperative choreoathetosis: anesthesiologic management of an unusual complication in cardiac anesthesia

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Background: Postoperative choreoathetosis ("post-pump chorea," PPC) is common in pediatric cardiac surgery but rare in adults. We report a 68-year-old male with no neurological history who developed PPC after elective double valve surgery (mitral valve repair, tricuspid ring, atrial fibrillation ablation, and left atrial appendage closure). Forty-eight hours post-surgery, the patient exhibited abnormal limb and facial movements. Neurological imaging (CT, EEG, MRI) revealed no abnormalities.

Case Report: A 68-year-old man with dyspnea underwent elective double valve surgery. He had no prior neurological or familial history. Anesthesia included midazolam, ketamine, remifentanil, cisatracurium, and low-dose propofol, maintained with sevoflurane. One unit of blood was transfused during cardiopulmonary bypass (CPB) for hemoglobin of 8.1 g/dL. Stable hemodynamics and cerebral oximetry were maintained, with norepinephrine (max 0.05 µg/kg/min) used briefly post-CPB. Aortic clamp time was 134 minutes, CPB time 154 minutes, with no hypothermia or hyperglycemia.

Forty-eight hours postoperatively, the patient developed choreoathetoid limb and facial movements, dyskinesia, blepharospasm, bradylalia, dysphagia, and psychomotor impairment. PPC was diagnosed based on clinical presentation. Tetrabenazine and clonazepam were initiated, and levetiracetam was added to prevent seizures. The patient was extubated three days later and discharged from the ICU on chorea management therapy.

Discussion: Choreoathetosis affects the limbs and orofacial regions, causing dyskinesia, hypotonia, dysphagia, and speech impairment. PPC typically occurs 2-14 days post-surgery and is associated with prolonged aortic clamp/CPB times, cyanosis, hypothermia, and lactic acidosis. Medlock et al. linked PPC to hypothermia and circulatory arrest but noted cases without these factors. This case highlights PPC in valve surgery without hypothermia or arrest, likely related to prolonged CPB, surgical complexity, and lactic acidosis.

References:

1. Park KW, Choi N et al. Post-Pump Chorea and Progressive Supranuclear Palsy-Like Syndrome Following Major Cardiac Surgery. Mov Disord Clin Pract. 2019;7(1):78-82.

2. Medlock MD et al. A 10-year experience with postpump chorea. Ann Neurol. 1993;34:820-826.

Learning Points

- Recognize PPC in patients with new movement disorders post-cardiac surgery.
- · Early identification and treatment improve outcomes and rehabilitation.

51AP06-12

Management of refractory shock: exploring the role of methylene blue

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Background: Refractory septic shock is a life-threatening condition characterized by profound vasoplegia and resistance to standard therapies, including fluid resuscitation, vasopressors, and corticosteroids. This case highlights the use of methylene blue intraoperative as a tool in a scenario of severe refractory shock secondary. Its importance lies in the patient's hemodynamic stabilization despite escalating vasopressor requirements, showcasing a potential alternative for patients unresponsive to conventional treatments.

Case Reporte: A 52-year-old male patient presented with intestinal perforation one week after undergoing a right hemicolectomy. Upon arrival in the operating room, he exhibited signs of septic shock, including tachycardia (HR 140 bpm), hypotension (MAP < 50 mmHg), and profuse sweating. During exploratory laparotomy, fecaloid peritonitis was identified. Despite aggressive management with fluid resuscitation and vasopressors (norepinephrine at 0.6 µg/kg/min and vasopressin infusion), the patient's hemodynamics remained unstable. A single dose of methylene blue (2 mg/kg over 10 minutes) was administered intraoperatively. Hemodynamic improvement was observed within 15 minutes, with stabilized blood pressure (MAP > 65 mmHg) and a reduced need for vasopressors. The patient was successfully transferred to the ICU for postoperative management.

Discussion: This case underscores the potential of methylene blue in managing refractory vasoplegic shock. Methylene blue inhibits inducible nitric oxide synthase (iNOS), reducing excessive nitric oxide production - a key factor in persistent vasodilation. Prior studies have demonstrated its efficacy in restoring systemic vascular resistance and decreasing vasopressor dependency. For example, Bassi et al. described methylene blue as a valuable adjunct in high-dose vasopressor-dependent shock. Despite promising results, its use is limited by a lack of standardized dosing protocols and potential adverse effects, such as rebound hypertension or methemoglobinemia. This case contributes to the growing body of evidence supporting methylene blue as a viable option for refractory shock, especially when administered early.

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- 1. Vincent J-L, De Backer D. Circulatory shock. N Engl J Med. 2013;369:1726-34.
- 2. Bassi E, Park M, Azevedo LC. Therapeutic strategies for highdose vasopressor-dependent shock. Crit Care Res Pract. 3. Rubio SG, Ezquerra PG. Introducción a la práctica clínica. 2022.

Learning Points:

- Methylene blue offers a promising alternative for refractory vasoplegic shock, particularly in patients unresponsive to conventional therapies.
- Early administration of methylene blue may enhance hemodynamic stabilization and reduce vasopressor dependency.
- Further research is required to establish standardized protocols and evaluate its long-term safety in critically ill patients

51AP07-1

Exploration of the degree of interprofessional collaboration (IPC) in the intensive care setting

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Background and Goal of Study: Interprofessional collaboration (IPC) involves healthcare professionals (HCPs) from diverse disciplines and specialities working together with patients, their families, carers, and communities to provide the highest standard of care. Research has identified several advantages of IPC, such as better quality of care, greater patient safety, higher job satisfaction, and reduced staff burnout and turnover.

Materials and Methods: A retrospective, cross-sectional research design was utilised. A self-administered structured questionnaire, composed of the Collaborative Practice Assessment Tool (CPAT) and Assessment of Interprofessional Team Collaboration Scale (AITCS-II) was distributed to 169 eligible HCPs working in the twenty-bedded mixed ICU in a general university hospital, between December 2022 and January 2023. Descriptive and inferential statistics were performed on the quantitative data utilising S.P.S.S. (version 28) with a one-way analysis of variance (ANOVA).

Results and Discussion: 110 (65.1%) eligible HCPs participated in the study. Statistically significant differences were observed between team leadership and employment status (p = .035); team leadership and respondents' profession and grade (p = .002) and the overall CPAT score and level of education (p = .029). The AITCS-II mean item score obtained was 3.443. The findings suggest that participants employed full-time and occupying senior positions, who are more likely to be in charge of the team, tend to rate IPC higher, reflecting their perceived leadership. Higher levels of education may also contribute to greater exposure to interprofessional education (IPE) experiences, which are fundamental to IPC. Also, it appears that a traditional hierarchal structural divide is present in the Maltese intensive care setting with physicians still holding the role of team leaders. The AITCS-II score of 3.443 indicates that currently the interprofessional team in the ICU is on the way to collaboration. This finding provides a baseline for future research and allows comparisons with other settings and populations.

Conclusion(s): The study indicates that Maltese ICU practice is progressing toward interprofessional collaboration, with communication being the main area needing improvement. Addressing areas like communication and team processes can inform the design and implementation of focused interventions to strengthen IPC such as interprofessional simulation training.

51AP07-2

Adherence to adult sepsis guidelines recommendation on the use of Vasopressin in patients with septic shock

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Background and Goal of Study: Threshold for adding vasopressin remains unclear in septic shock patients. If mean arterial pressure is inadequate despite low-to-moderate norepinephrine (NE), updated adult sepsis guidelines suggest adding vasopressin as a second-line vasoactive agent.

We designed this study to evaluate adherence to Surviving Sepsis Campaign (SSC) Guidelines 2021 on vasoactive agent management.

Materials and Methods: Retrospective observational cohort study in 155 adult patients with septic shock (Sepsis-3 definition) admitted to ICUs in a single University hospital from January through December 2023. Patients were divided into two groups according to NE dose at the time of vasopressin initiation (<0.25 or ≥0.25 μg/kg/min).

Primary endpoint was physician prescriptive practice over study period.

Secondary outcomes included the duration and maximal doses of NE and vasopressin, adverse effects (digital ischemia, arrhythmias) and in hospital mortality.

Results and Discussion: From 155 eligible patients, 90 (58%) received high dose NE (≥0.25 μg/kg/min). Of those, 54 patients (58%) started vasopressin infusion. When comparing vasopressin prescription during first and second semester, no differences were found (31 vs 39%, p= 0.29). In the low dose NE (<0.25 μg/kg/min) group, only two patients received vasopressin.

Mean dose of vasopressin was 0.05 UI/min (CI 95% 0.03-0.07) and mean duration of vasopressin infusion was 0.7 days (IC 95% 0.5-0.9). Patients who received NE + vasopressin showed more digital ischemia compared to patients who only received NE (20% vs 1%, p< 0.001).

No differences were found in hospital mortality (55.8%in NE + vasopressin group and 47.4% in NE group; p=0.4).

Conclusion(s): In our study, the overall percentage of patients who were treated with the last guideline-recommended therapy was low at 58% and didn't increase over the study period.

The digital ischemia was a common side effect observed in the group of vasopressin+ NE, but that can be affected by the NE doses and any pre-existing comorbidities.

51AP07-3

Evaluation of microcirculation in septic shock patients during vasopressor therapy using remote photoplethysmography parameters. Pilot study

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Background and Goal of Study: Septic shock is a life-threatening condition associated with high mortality. In the intensive care unit, resuscitation therapy typically includes fluid administration and vasopressor infusion, with the primary goal of improving tissue microcirculation. However, high doses of vasopressors can lead to excessive vasoconstriction, potentially impairing tissue perfusion. Remote photoplethysmography (rPPG) is a non-invasive, low-cost optical technique for monitoring tissue perfusion that could provide valuable insights during vasopressor therapy. The aim of this study was to evaluate changes in rPPG signal parameters and the microvascular bed during vasopressor treatment.

Materials and Methods: This single-center, prospective observational pilot study included six patients diagnosed with septic shock. During the study, varying doses of noradrenaline were administered as part of vasopressor therapy. Continuous arterial blood pressure was monitored using a bedside monitor, and remote photoplethysmography (rPPG) signals were collected from the skin on the palm and foot. Single-period rPPG waveforms were extracted and averaged.

Six hemodynamic parameters were calculated from the averaged rPPG waveform: Perfusion Index (PI); Incisura amplitude (Inc); Amplitude of the diastolic wave (Dia); Dia/Inc ratio; Incisura curvature; Diastolic curvature.

Results: Our study results show, that during increased vasopressor dosage comparing patients palm vs foot skin - MAP increased by 20 % vs 16 %, PI increased by 67% vs 38 % [0.21-0.63 vs 0.16-0.22], Inc increased by 24% vs 3% [0.67-0.83 vs. 0.67-0.69], Dia increased by 40% vs 26% [0.41-0.684 vs 0.43-0.54], Dia/Inc ratio increased by 43% vs 17 % and incisura curvature decreased by 50% vs 50% [med 0.00186 vs 0.0046], diastolic curvature decreased by 43% vs 67 % [med 0.00292 vs 0.0038].

Discussion: In our study, we observed that during vasopressor therapy in septic shock patients, rPPG signal parameters in the palms increased more significantly than in the feet and demonstrated a notable sensitivity to hemodynamic changes.

Conclusion(s): Our findings suggest that rPPG signal parameters undergo significant changes during vasopressor therapy in septic shock patients and may serve as reliable indicators for assessing tissue perfusion and responsiveness to resuscitation interventions

Acknowledgements:This study was supported by Latvian Council of Science project FLPP-0326 (Izp-2022/1-0326)

51AP07-5

Assessment of microcirculation blood flow during venous occlusion test using remote photoplethysmography in septic shock patients

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Background: Septic shock can lead to alterations in microcirculatory perfusion. Remote photoplethysmography, a non-invasive bedside method, allows for the assessment of microcirculatory perfusion. Evaluating perfusion during a venous occlusion test has been proposed to assess venous perfusion parameters, reflecting the capacity of microvessels to dilate and/or be recruited

The aim of our study was to evaluate changes in microcirculatory blood flow during venous occlusion tests using remote photoplethysmography in patients with septic shock.

Materials and Methods: This prospective observational study included 11 healthy volunteers and 13 septic shock patients. Perfusion and pulse wave parameters were measured using remote photoplethysmography during a 9-minute venous occlusion test (3 minutes baseline, 3 minutes occlusion, and 3 minutes release). Data were analyzed using non-parametric Mann-Whitney tests.

Results: Our study demonstrated that healthy volunteers had a higher perfusion index after release compared to septic shock patients (1.996 \pm 0.795 vs. 1.437 \pm 0.519). Conversely, the septic shock group showed higher incisura amplitude (0.993 \pm 0.0064 vs. 1.025 \pm 0.0072) and diastolic amplitude (0.98 \pm 0.076 vs. 1.002 \pm 0.165) after release.

Discussion: In our study, septic shock patients exhibited stiffer blood vessels, likely due to vasopressor use and altered microcirculation.

Conclusion(s): Our findings indicate that remote photoplethysmography holds potential as a reliable method for assessing venous perfusion in septic shock patients during venous occlusion tests. Furthermore, septic shock patients were observed to have increased vascular stiffness, likely reflecting the pathophysiological impact of their condition.

Acknowledgements: This study was supported by Latvian Council of Science project FLPP-0326 (Izp-2022/1-0326).

51AP07-6

Analysis of the implementation of an early detection system for complications with a rapid response team in surgical wards at a tertiary care hospital

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Background and Goal of Study: Patients admitted to hospital wards frequently experience complications associated with increased mortality, longer hospital stays, and higher healthcare costs. Rapid response systems (RRS) are structures designed to address patients who may develop these events, with the goal of early detection. This resource was implemented at the Hospital Clínic de Barcelona (HCB) in 2021.

Hypothesis: The implementation of RRS at HCB reduces mortality, hospital stays, and the severity of complications, while being cost-effective and optimizing healthcare resources.

Materials and Methods: A comparative study of effectiveness and costs was conducted. Data from patients admitted to the surgical wards were collected for two one-year periods, retrospectively and prospectively (2019 and 2022).

Effectiveness was measured in terms of mortality, complications, and life-years gained (LYG). Data on the length of stay (LoS) in conventional wards and ICU, as well as readmission rates, were collected to assess resource utilization. The chi-square test was used to compare categorical variables, and t-tests and Wilcoxon tests were applied for continuous variables with normal and non-normal distributions, respectively.

Results and Discussion: A total of 7,892 patients were included in the pre-implementation period and 7,257 in the post-implementation period. Both populations were comparable in terms of age, sex, and type of admission (scheduled vs. emergency).

A significant reduction in the average LoS was observed in both conventional wards (4.12 vs. 3.89 days) and ICU (2.29 vs. 2.09 days) (p<0,001), accompanied by actual savings of €681,432, even after accounting for the costs of implementing and maintaining the RRS. A significant difference was also observed in the severity of complications upon ICU admission.

Additionally, there was a 33.5% reduction in hospital arrest team activations. No significant differences were found in the number of ICU admissions, mortality rates, or life-years gained (LYG).

Conclusion(s): The implementation of the RRS is beneficial and cost-effective, as it significantly reduces hospital stays in both conventional wards and UCIs, without increasing patient mortality. All of this results in significant economic savings. Additionally, it leads to a notable reduction in the activation of the hospital arrest team.

51AP07-7

Examination of the effects of chromium levels on glucose metabolism, lipid metabolism, morbidity, and mortality rates in intensive care patients

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Background and Aim: Monitoring and managing chromium levels in critically ill patients are crucial for optimizing metabolic control, preventing complications and supporting overall recovery.

This study aims to evaluate the effects of blood chromium levels on glucose metabolism, lipid metabolism, morbidity and mortality rates in the intensive care unit (ICU) patients.

Materials and Methods: Patient demographics, comorbidities, reasons for ICU admission, APACHE-II and SOFA scores, nutritional status, and ICU and hospital lengths of stay were prospectively documented. Blood samples were collected on the day of ICU admission and weekly thereafter during the ICU stay. HbA1c, lipid panel, blood chromium levels and daily blood glucose levels were measured. Glycemic coefficients of variation of patients were calculated. Chromium levels were measured using ICP-MS. Mann-Whitney U and Spearman's Rho tests were applied for non-normally distributed data. Associations between variables and outcomes were evaluated using Chi-square tests with Bonferroni correction for multiple comparisons.

Results and Discussion: A total of 309 patients were included in this study. No statistically significant association was found between chromium levels and glucose or lipid metabolism indicators. This finding may be attributed to the complex interplay of critical illness factors that could overshadow chromium's metabolic effects. However, plasma chromium levels measured on the 7th ICU day were significantly associated with mortality (p=0.017). Plasma chromium levels were significantly lower in deceased patients.

Additionally, plasma chromium levels and mortality rates were higher in patients with greater glycemic CV, though this was not statistically significant. Mortality rates were also significantly associated with male gender, higher SOFA and APACHE-II scores, high triglyceride and VLDL levels, and low HDL, LDL and total cholesterol levels.

Conclusion: Based on the data that chromium deficiency is associated with increased mortality and prolonged hospital stay by causing hyperglycemia and dyslipidemia, this study aimed to provide a novel perspective to the existing literature in terms of reducing morbidity and mortality rates in critical care settings according to chromium levels.

Although plasma levels measured on day 7 in the ICU were significantly associated with mortality, this study did not find a direct effect of chromium levels on glucose and lipid metabolism in ICU patients.

51AP07-8

Descending necrotizing mediastinitis: a retrospective analysis of 13 cases

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Background: Descending necrotizing mediastinitis (DNM) is a rare but serious infection with high mortality. We aimed to describe 13 patients treated in our center.

Materials and Methods: A retrospective review was performed of patients diagnosed with DNM and treated at our center between 2020 and 2024. Variables analyzed included: epidemiology, clinical presentation, classification, microbiology, treatment, complications, and outcome. Qualitative variables are presented as absolute numbers and percentages, and quantitative variables as median and interquartile range (IQR 25-75).

Results: Most patients were men (92%) with a median age of 50 years (IQR 45-63). Common comorbidities were smoking (69%), hypertension (38%), diabetes (38%), corticosteroid use (15%) and hypoperfusion diseases (15%). Symptoms before diagnosis lasted 6.5 days (IQR 4-7). Fever (77%) and odynophagia (62%) were the most common symptoms.

Other symptoms were dysphagia (38%), dyspnea (31%), trismus (23%), and chest pain (8%). The infectious focus was pharyngeal in 62% of cases, odontogenic in 23%, and cervical in 15%. Classification according to Endo: Endo I (31%), IIA (62%), and IIB (8%). Most DNM were polymicrobial (69%).

Gram-positive bacteria were found in 83% of the samples, gramnegative in 50%, and anaerobes in 67%. S. constellatus and Prevotella spp were the most common species.

All patients received surgery. The time from diagnosis to surgery was 2 hours (IQR 2-3). The most common surgical approach was transcervical (92%), followed by VATS (77%). Seven patients (54%) required tracheostomy. The antibiotic treatment duration was 42 days (IQR 28-52).

Most frequent complications were: respiratory failure (85%), pleural effusion (69%), septic shock (69%), and airway obstruction (62%)

Other complications included pneumonia (38%), renal failure (31%) and pericardial effusion (23%). The hospital stay was 39 days (IQR 26-56), with 18 days (IQR 6-27) spent in critical care. One in-hospital death was recorded, but no mortality was reported at one year.

Conclusions: The clinical presentation of DNM is unspecific, so a high index of suspicion is required for diagnosis. Treatment includes broad-spectrum antibiotics and early, sometimes repeated, surgical intervention. Despite severe complications, early combined treatment significantly reduce mortality.

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51AP07-10 Delirium in ICU patients with noninvasive mechanical ventilation

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Background and Goal of Study: delirium is a disorder characterized by a fluctuating alteration of consciousness, with changes in attention and perception of the environment. There are three subtypes: hyperactive, mixed and hypoactive. The most common form of presentation in ICU is the hypoactive subtype (1). The appearance of delirium is associated with longer stay in the ICU, complications and mortality.

The aim of this study was to assess whether noninvasive mechanical ventilation (NIV) is a risk factor for delirium. A secondary objective was to determine whether COVID infection is a risk factor for delirium.

Materials and Methods: through a single-center retrospective observational analysis of 145 patients submitted to NIV in ICU, we performed a multivariate analysis of the risk factors for delirium. Neurocritical patients and those who had previously received invasive mechanical ventilation were excluded.

Results and Discussion: the incidence of delirium in the sample (4.14%) was lower than that described in the literature (22%) (1). The most frequent subtype found in this sample was the hyperactive subtype.

We found a higher incidence in the group that spent more time with NIV, although this was not statistically significant.

We did not find a statistically significant association between risk factors and the appearance of delirium, neither with COVID infection.

Limitations of the study were low statistical power, a single-center study, and few cases of delirium collected in the sample.

Conclusion(s): we have found associations between the use of NIV and delirium that, although not statistically significant, are worth analyzing in future studies.

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51AP07-11

Predicting non-invasive ventilation failure: Insights from the MIMIC-IV large-scale dataset

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Background and Goal of Study: Background and Goal: Non-invasive ventilation (NIV) and high-flow nasal cannula (HFNC) are common critical interventions to prevent intubation in intensive care unit (ICU) patients with respiratory failure. Despite their prevalence, both modalities exhibit high failure rates. Delayed intubation after NIV/HFNC failure increases mortality, underscoring the need for better prediction tools. The ROX index and other methods show limited predictive ability. This study utilises the MIMIC-IV database to explore variables improving NIV failure prediction using machine learning models.

Materials and Methods: We conducted a retrospective analysis using data from 73,181 ICU admissions of 50,920 patients in the MIMIC-IV database (2008–2019). Patients undergoing their first NIV episode in pressure support or continuous positive airways pressure modes were included, excluding those with prior invasive mechanical ventilation or intubation more than 24 hours after NIV initiation. NIV failure was defined as the need for intubation, return to NIV, or death, all within 24 hours of NIV termination. We extracted demographic data, admission SOFA scores, laboratory and ventilatory data (mean values over the first two hours). These measures were used in logistic regression, XGBoost, and random forest models to assess feature importance and predict NIV failure.

Results and Discussion: Among 2312 NIV-ventilated patients, 987 (42.7%) experienced NIV failure. In prediction of NIV failure, logistic regression achieved the highest AUROC (0.66), followed by random forest (0.63) and XGBoost (0.58) (Figure 1).

Feature importance analysis revealed SOFA score as the strongest predictor across all models, followed by respiratory rate, SpO_2 and PaO_2 .

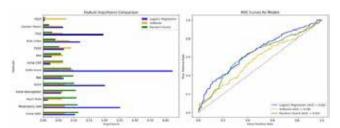


Figure 1.

Conclusion(s): Our study highlights the challenges of accurately predicting NIV failure using machine learning models, even when applied to a large, high-quality ICU dataset such as MIMIC-IV. Although predictive models provide valuable insights, the complexity of assessing NIV failure still requires the judgment and experience of clinicians.

51AP08-2

Perioperative complications in simultaneous heart and kidney transplantation: a range of possibilities

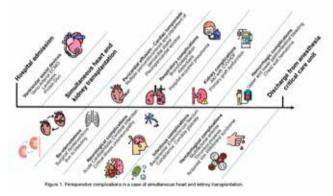
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Background: Ischemic dilated cardiomyopathy (IDC) is a serious condition that frequently leads to advanced heart failure. These patients often require circulatory support devices and, in critical cases, an urgent heart transplant.

We present a case of simultaneous heart and kidney transplant in which multiple complications developed. This case illustrates the wide range of possible complications and the absolute need for multidisciplinary management.

Case report: A 56-year-old man with ischemic dilated cardiomyopathy (IDC), atrial fibrillation, pulmonary hypertension (PH), severe ventricular dysfunction (LVEF 23%) and a single-functioning kidney (renal artery thrombosis) was admitted for congestive heart failure (CHF), requiring ICU admission due to hemodynamic instability, with successive placement of Veno-Arterial Extracorporeal Membrane Oxygenation (V-A ECMO), Levitronix, and Protek-Duo. A simultaneous heart and kidney transplantation was performed. Perioperative complications can be seen in Figure 1.



Discussion: This case exemplifies the vast range of complications that can arise in simultaneous heart and kidney transplantation. While circulatory support devices are lifesaving, they add layers of complexity to perioperative care. Ultimately, continuous monitoring, early intervention, and a well-coordinated multidisciplinary approach remain the cornerstones of improving patient survival and postoperative quality of life.

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Learning points: This case highlights the complexity of perioperative management in transplant patients especially in those using circulatory support devices, emphasizing the importance of continuous monitoring and interdisciplinary management.

Tricuspid valve repair following an electric scooter accident: a case report

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Background: Tricuspid valve repair surgery in the immediate postoperative period of a polytraumatized patient: yes or no? We present the case of an 18-year-old patient who, after severe polytrauma, was diagnosed with severe tricuspid regurgitation and urgent surgical repair was decided.

Case Report: A male, with no relevant medical history, polytraumatized after an electric scooter accident was diagnosed with hemoperitoneum due to a splenic rupture and right hemothorax with severe anemia. After a splenectomy and thoracic drainage, the patient was transferred to our center for postoperative intensive care. Despite hemodynamic and volume resuscitation, an increase of vasoactive drugs was required. A transthoracic echocardiogram revealed a severely dilated right ventricle and free tricuspid regurgitation caused by papillary muscle rupture. An angio-CT scan ruled out active bleeding, and urgent surgical intervention was carried out with systemic heparinization for extracorporeal circulation. The surgical procedures included papillary muscle reimplantation, neochord insertion, and tricuspid ring implantation. The patient was discharged from the unit 15 days later in stable condition. A follow-up transesophageal echocardiogram showed moderate tricuspid regurgitation and no signs of heart failure.

Discussion: Tricuspid regurgitation due to trauma is an extremely rare complication, and to our knowledge, this is the first reported case involving an electric scooter accident. Typically diagnosed months or years later due to arrhythmias or heart failure, this case was identified in the immediate postoperative period, and surgical intervention was decided within 24 hours of the accident and the initial surgery. A review of previous case reports suggests that early surgery reduces the risk of heart failure and the need for valve replacement.

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- 2. Enomoto M, Takashima N, Kamiya K, Lee J, Hachiro K, Wakisaka H, et al. Surgical repair for primary tricuspid regurgitation related to trauma. Journal of Cardiology Cases. June 1, 2024; 29(6):251-3.

Learning points: Tricuspid rupture should be considered in traumatized patients. In this case, the involvement of an electric scooter is particularly relevant, as this is a rapidly growing mode of transportation used by millions of people worldwide.

51AP08-4

The critical appraisal of the predictive power of substances with antioxidant properties in patients with COVID-19: a journey towards cure and hope in severe cases

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Background and Goal of Study: This study provides a comprehensive critical review of various predictor variables known for their antioxidant properties, specifically on albumin, ferritin, urea, and bilirubin. It aims to evaluate how these substances influence the health outcomes of critically ill patients diagnosed with COVID-19. By analysing these variables, the research seeks to enhance our understanding of their roles in the progression and management of the disease in this vulnerable patient population. Materials and Methods: From Jan 1, 2021, to Jan 1, 2023, a prospective observational study was conducted involving 275 critically ill patients who tested positive for COVID-19 through polymerase chain reaction (PCR) testing. At the time of a patient's admission to the ICU, a comprehensive set of laboratory tests is performed to gather essential information about their health status. For clinical prediction models, we employed receiver operating characteristic (ROC) curves, which are used to predict the risk of occurrence (diagnostic research) or development (prognostic research). These models provide individual risk predictions based on the values of the predictors included in the model. One of the key aspects of performance is discrimination, the ability to separate parameters that could be a predictive factor. We used albumin, ferritin, urea, and bilirubin as independent quantitative variables, while the adverse outcome of critically ill COVID-19 patients served as the dependent variable.

Results and Discussion: The p-value of less than 0.001 for the Area Under the Curve (AUC) of the Receiver Operating Characteristic (ROC) curve demonstrates statistically solid significance in evaluating the model's serum albumin and BAL albumin performance. In comparison, the AUC ROC for ferritin, urea, and bilirubin does not exhibit any statistical significance within our model. While various substances in the body possess antioxidant properties, an important avenue for further research is whether these properties diminish in cases of organ dysfunction, such as multiorgan failure.

Conclusion(s): Our results show that specific sensitivity and specificity values are only clinically relevant for the comparison. In this comparison between albumin, ferritin, urea, and bilirubin, we can only rely on the albumin values in both serum and BAL and consider them relevant outcome-predictive factors.

Intensivist approach to the treatment of gynecological-obstetrical complications - necrotizing fascitis

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Background: Necrotizing fascitis is a fulminant infection that involves large areas of soft tissue necrosis, most often affecting the limbs, perineum and abdominal wall.

Case Report: A 27-year-old patient was hospitalized in the Intensive Care Unit of KBC Bežanijska Kosa due to a wound infection and developed necrotizing fasciitis after an emergency caesarean section 7 days earlier.

A month before the caesarean section, COVID pneumonia was diagnosed and treated. Patient with accompanying comorbidities: systemic lupus since 11 years of age, rheumatoid arthritis on therapy with prednisone, azatrioprin and hidroxicloroquina. With a fracture of six thoracic vertebrae as a result of osteoporosis and corticosteroid therapy.

On the lungs, auscultatory bilateral audible breathing, basally weakened. Chest CT: Diffuse reticular interstitial changes in the lungs, non-COVID, according to the LE type, bilateral pleural effusions. SOFA 5, APACHE II 11. Enterococcus spp isolated from the operative wound, vancomycin resistant (VRE).

Treated with antibiotic therapy based on antibiogram. Surgical treatment carried out by necrosectomy and implantation of the "Abthera VAC System". After 12 days and 4 changes of the sponge membrane, the VAC system was successfully removed and the wound closed.

The surgical recovery was accompanied by an improvement in the clinical, laboratory and radiological parameters of the infection. She was treated with a multidisciplinary approach throughout her hospitalization. After 18 days of treatment in our institution, the patient was released for home treatment in a stable general condition.

Discussion: Infections can be intra-abdominal or around the surgical wound; these sometimes dangerous infections can increase morbidity and mortality, prolong hospital stays, and increase treatment costs. Females undergoing cesarean section have a 5 to 20 times higher chance of infection compared to those who gave birth vaginally.

Risk factors associated with necrotizing fascitis: diabetes mellitus, intravenous drug abuse, age over 50 years, immunodeficiency states, hypertension and malnutrition/obesity. Group A Streptococcus is the most common monomicrobial isolate, polymicrobial infections with various gram positive, gram negative, aerobic and anaerobic isolates.

51AP08-6

Assessment of the clinical significance of scoring systems for assessing severity and outcome in patients with acute pancreatitis

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Background and Goal of Study: Acute pancreatitis (AP) is a sudden inflammation of the pancreas with an unpredictable course and uncertain outcome. Early diagnosis of AP, in the first 24 - 48 hours, especially in fudrujant forms, can be very difficult. We use laboratory tests, imaging diagnostics and scoring systems to predict the severity and outcome of AP.

The aim of this study is to examine the factors that are the simplest to apply and most objective for assessing the severity of AP, predicting the development of complications, and the outcome of patient treatment in our conditions.

Materials and Methods: The research was conducted as a prospective study and included patients admitted to the surgical department or to the Intensive Care Unit level II and III with a diagnosis of AP. The research was conducted in several phases: on admission (zero day), 48, 72 hours, 7 days and 12 months after admission.

Results and Discussion: In our study, there were 50 patients, of whom 84% survived to discharge from the hospital and 16% died. The most common cause of AP was gallstones, slightly more common in women than in men, while alcoholism was the cause of AP only in men. Severe pancreatitis was statistically significantly more common in younger patients and patients with a higher body mass index (BMI). Patients with severe AP were on mechanical ventilation (MV) for longer and were treated in the intensive care unit (ICU) for longer. Patients with sepsis/septic shock as a complication were on MV for significantly longer.

The best prognostic value for predicting the outcome of treatment of patients with AP on the day of admission (day zero) was shown by MEWS $_0$, APACHE II $_0$ and BISAP $_0$ scoring systems. After 48 hours, APACHE II $_{48}$ and MEWS $_{48}$.

Compared to other scoring systems, MEWS $_{72}$ and 7d showed a slightly better prognostic value in predicting the outcome of treatment 72 hours and 7 days after admission compared to BISAP $_{72}$ and 7d scoring systems. Of the biochemical markers of inflammation, PCT determined on day 7 had the best degree of discrimination.

Conclusion(s): The application of scoring systems and biomarkers of inflammation in different phases of treatment is important in assessing the prediction of the final outcome, severity of AP, occurrence of complications, length of stay in the ICU, and length of MV. The prognostic value of the scoring system for treatment outcome 48 hours after admission was better than that of CRP and PCT.

Rhabdomyolysis following acute right mastitis in a postpartum woman: a case report

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Background: Rhabdomyolysis, characterized by the breakdown of skeletal muscle fibers and the release of intracellular contents into the bloodstream, is a rare but serious complication in the postpartum period.

This case report presents a unique instance of rhabdomyolysis following acute right-sided mastitis in a postpartum woman.

Case Report: The patient, a 29-year-old woman, developed sudden-onset muscle pain, weakness, and dark-colored urine after being diagnosed with right mastitis. Blood tests confirmed rhabdomyolysis with elevated CK and myoglobin levels.

Treatment included aggressive IV isotonic saline to prevent acute kidney injury (AKI). By day three, urine output decreased to 1700 mL/24 hours, though renal function remained slightly impaired. CRRT was considered but avoided in favor of diuretic therapy and fluid resuscitation, guided by CVP monitoring. Sodium bicarbonate was trialed for urine alkalinization despite limited evidence of its efficacy.

Discussion: This case underscores the importance of early recognition and management of rhabdomyolysis in postpartum patients with unusual infection-related complications. It highlights the challenges in therapeutic decision-making, including the role of CRRT and urine alkalinization, and emphasizes the need for individualized, evidence-informed approaches to prevent renal complications.

Further research is warranted to clarify the relationship between postpartum infection and rhabdomyolysis and to establish optimal management strategies in similar cases.

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Bosch X, Poch E, Grau JM. Rhabdomyolysis and acute kidney injury. *N Engl J Med.* 2009;361:62–72. Safari S, Yousefifard M, Hashemi B, et al. The value of serum creatine kinase in predicting the risk of rhabdomyolysis-induced acute kidney injury: A systematic review and meta-analysis. *Clin Exp Nephrol.* 2016;20:153–61.

Learning Points:

- Clinicians should consider rhabdomyolysis in postpartum women presenting with systemic symptoms and muscle pain following infections.
- 2. Early diagnosis and aggressive fluid resuscitation are essential to prevent complications such as AKI.
- 3. Postpartum physiological and inflammatory changes may predispose to unusual complications, requiring a high index of suspicion
- Individualized management strategies, including decisions on CRRT and supportive therapies, are crucial in uncertain scenarios.

51AP08-8

Compound 21, a non-peptide agonist of angiotensin II type 2 receptor, attenuates organ injury and survival in septic rats

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Background and Goal of Study: Sepsis is complicated by a variety of conditions such as septic shock, vascular hyporeactivity to inotropics and immune disturbance, contributing to poor organ perfusion and then multiple organ dysfunction syndrome. Previous studies revealed that the angiotensin II type 2 receptor (AT2R) agonist could reduce inflammatory response and ischemia injuries in brain and heart. We found that CGP42112, a peptide AT2R agonist, significantly attenuated hypotension, organ dysfunction and mortality in rats with polymicrobial sepsis.

The purpose of this study is to evaluate whether non-peptide AT2R agonist, compound 21 (C21), can protect rats from septic shock and organ injury induced by cecum ligation puncture (CLP).

Materials and Methods: In this study, male Wistar rats received CLP or sham operation followed by the intravenous administration of saline or C21 at 3 hours after sham operation or CLP. The changes in biochemical and hemodynamics variables as well as plasma chemokine and nitric oxide levels were detected during the 24-hour observation. Rats were then euthanized for subsequent histological examination.

In addition, we used LPS and nigericin-stimulated cell model to examine the effects of C21 on sepsis-induced macrophage pyroptosis. J774A.1 cells were pretreated with different doses of C21 for 30 minutes, then incubated with LPS (100 μ g/ml) for 4 hours and nigericin (10 mM) for 3 hours to induce pyroptosis.

Results and Discussion: CLP lead to multiple organ injuries, characterized by elevated plasma biochemical parameters and histopathological changes, which were attenuated by C21 administration.

Furthermore, C21 significantly attenuated plasma production of chemokines and nitric oxide, but also reduced lung expressions of inducible nitric oxide synthase, cytochrome c and caspase-3 in CLP rats.

Meanwhile, C21 significantly decreased the protein expression of IL-1 β , cleaved-caspase1, and gasdermin-D in J774A.1 cells. More importantly, C21 improved the survival of rats with sepsis.

Conclusion(s): In this animal model of polymicrobial sepsis, C21 protected against organ dysfunction at 24 hours following CLP possibly through anti-inflammatory response and anti-apoptosis. Moreover, C21 inhibited the activation of inflammasome-stimulated pyroptosis in macrophages. It suggests that the treatment of AT2R stimulation provides a promising therapeutic candidate for sepsis.

ACE inhibitors and calcium channel blockers concomitant poisoning: multimodal approach

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Background: Calcium channel blockers (CCBs) and angiotensinconverting enzyme inhibitors (ACEI) are widely used antihypertensives. Overdoses can lead to severe vasodilatory shock and cardiodepression, resulting in life-threatening hemodynamic instability. Treatment is supportive due to the absence of a specific antidote. This case details a patient's survival after ingesting lethal doses of both drug classes through multimodal therapy.

Case Report: A 51-year-old female with a history of hypertension and schizophrenia was admitted after ingesting 90 tablets of perindopril/amlodipine and 30 tablets of perindopril in a suicidal attempt.

On presentation, she was hemodynamically stable but quickly developed severe vasoplegic shock with escalating doses of vasopressors (norepinephrine up to 4.5 μ g/kg/min, vasopressin 0.06 IU/min). Hemodynamic monitoring revealed high cardiac output with low systemic vascular resistance index.

The treatment included calcium supplementation, hyperinsuline-mic-euglycemic therapy (HIET), intravenous lipid emulsion (ILE), and continuous hemodialysis due to anuria. The patient was intubated and ventilated following a decrease in consciousness. Methylene blue (MB) was administered as a third vasopressor, and naloxone was introduced at high doses as a last-resort therapy. After 48 hours, vasopressor doses could be tapered, urine production resumed by Day 3, and the patient was extubated on Day 10 with full neurological recovery. She was discharged on Day 41.

Discussion: Mixed CCB and ACEI overdoses are rare but pose significant therapeutic challenges due to amplified vasodilatory effects. Current literature supports using HIET, ILE, and MB in refractory shock, but their combination in severe cases is rarely reported.

This case also highlights the application of high-dose naloxone for antagonizing endogenous opioids. Survival in such cases is rare, highlighting the importance of aggressive multimodal therapy and advanced monitoring. This report contributes to evidence supporting innovative approaches to life-threatening drug overdoses.

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Learning Points:

Early multimodal therapy is crucial in managing severe CCB and ACEI intoxication.

Prompt intervention and advanced monitoring improve neurological outcome.

51AP08-10

Transfusion confusion. Diagnostic difficulties in critically ill patient with acquired hemophilia A due to blood product transfusions

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Background: Acquired hemophilia A (AHA) is a rare coagulopathy with incidence of 1.5 cases per million per year.¹ Although diagnostic criteria for AHA are clearly defined, treatment of an acutely bleeding critically ill patient with blood products may interfere with laboratory studies, which can cause misdiagnosis and delay of proper treatment. The aim of this case report is to highlight the importance of correct timing of blood sampling.

Case Report: Female, 65 years old, was admitted in district hospital with shortness of breath and lower extremity oedema. Symptoms developed over several months after acute viral respiratory infection. X-ray showed right sided hydrothorax and pleural puncture was performed. Haemoglobin decreased from 12.9 to 7.0 g/dL in 5 days after puncture and right sided haemothorax was detected. Bleeding occurred from all blood vessel puncture sites and patient received regular life-saving blood product transfusions. Coagulation studies showed extremely prolonged APTT. Patient was transferred to ICU of Riga Eastern University Hospital. Prolonged clotting time (531 sec.) and clot formation time (132 sec.) were detected in ROTEM intrinsic pathway. While receiving blood product transfusions coagulation study showed high F VIII activity >150% (N=70-150%). After one week of targeted treatment with human plasma products, coagulation study was repeated.

Results shoved low F VIII activity (0.9%) and high F VIII inhibitor level - 55 BU(N<0.5 BU). Treatment with recombinant F VIIa was initiated and bleeding mitigated. Specific immunosuppressive therapy was started and patient was able to be transferred.

Discussion: The diagnosis of AHA itself is challenging due to the rare occurrence. Transfusion of blood products can lead to significant errors in coagulation studies and may delay targeted treatment. Thanks to multi-disciplinary teamwork repeated coagulation studies were repeated in correct time.

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Learning Points:

- Intensivists must have in-depth understanding of coagulation, coagulopathy diagnostics and treatment.
- Multi-disciplinary team is an essential part of successful and timely management of critical care patients with rare diseases.
- Correct timing of blood sample collection is crucial in the diagnosis of coagulopathies because blood product transfusions can affect the results.

A systematic review on the long-term outcomes of atrial fibrillation in critical care patients

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Background and Goal of Study: Atrial fibrillation (AF) is an arrhythmia with a lifetime risk of up to 33% after 45 years old and is often managed with medication including anticoagulation. Newonset atrial fibrillation (NOAF) develops in 4.5% to 15% of patients in critical care, and it is linked to additional risk factors such as infection, electrolyte abnormalities, pain, and inotropic support. As a result, NOAF is commonly not treated as it may resolve alongside illness resolution.

However, growing evidence suggests that NOAF in critical care is associated with increased long-term mortality and morbidity from stroke, heart failure, and recurrent hospitalisations with AF. There is a need to compare the outcomes of NOAF, pre-existing atrial fibrillation (PEAF), and those without AF in critical care to inform management plans.

Methods: This systematic review has been registered with PROSPERO (CRD42024593912). Ovid MEDLINE, EMBASE, and Ovid Emcare were systematically searched on 23rd July 2024 using relevant medical subject headings and keywords. Studies with patients who were 16 years and older in critical care or high dependency units who developed NOAF or with PEAF and had any reported ≥30-day mortality or thromboembolic outcome were included.

Two reviewers (NAC, JC) independently performed title and abstract screening, full-text screening, data extraction, Newcastle Ottawa Scale risk of bias and quality assessment in Covidence. All conflicts were discussed with support from a senior third reviewer (BWJ).

Trial and patient characteristics, outcomes, and risk of bias in tables and forest plots were extracted. Where appropriate, forest plots show pooled analysis using a random-effects model.

Results and Discussion: The literature search identified 3357 studies. After screening, 25 studies were included for full-text analysis including 11 prospective and 14 retrospective observational studies.

Results suggest heterogeneity between studies and no standardised outcomes, limiting opportunities to compare studies and continue with meta-analysis.

Conclusion: This systematic review investigates the long-term mortality and thromboembolic outcomes of NOAF and PEAF in adults hospitalised in critical care to help direct management. Significant variation in outcomes reported, study design chosen and patient populations studied limit generalisability of results. Core outcome sets are needed to allow comparison of studies in the future.

51AP08-12

Early postoperative albumin replacement after colorectal surgery: is it beneficial?

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Background and Goal of Study: Hypoalbuminemia is a known predictor of postoperative complications, including infections, delayed wound healing, and prolonged recovery in colorectal surgery patients. While albumin replacement is commonly used to address low postoperative albumin levels, its clinical efficacy remains controversial.

This study aimed to evaluate the impact of early postoperative albumin replacement on complication rates, ICU length of stay, and 90-day mortality in patients undergoing elective colorectal surgery.

Materials and Methods: This retrospective study included 164 patients who underwent elective colorectal surgery at Koc University Hospital between January 2018 and December 2023. Patients aged ≥18 years requiring at least 24 hours of ICU care postoperatively were included. Serum albumin levels were assessed preoperatively and immediately postoperatively, with patients categorized into groups based on serum albumin levels (<3.5 g/ dL or ≥3.5 g/dL) and whether they received albumin replacement. Patients receiving albumin were administered 100 mL of 20% albumin solution three times daily.

Outcomes assessed included postoperative complications, ICU length of stay, and 90-day mortality. Data were analyzed using Mann-Whitney U, Pearson Chi-Square, and multivariate logistic

Results and Discussion: Patients with hypoalbuminemia were significantly older and had shorter operative durations but showed no significant association with complication rates, ICU stays, or 90-day mortality. Albumin replacement was associated with significantly higher complication rates (56.5% vs. 17.9%) and longer ICU stays (p<0.001).

The findings suggest that albumin replacement is often employed in patients with greater clinical severity, potentially confounding its association with adverse outcomes. These results align with prior studies questioning the routine use of albumin in critically ill postoperative patients.

Conclusion(s): Early postoperative albumin replacement was not associated with improved clinical outcomes in colorectal surgery patients requiring ICU care.

On the contrary, its use correlated with higher complication rates and prolonged ICU stays. These findings emphasize the importance of individualized decision-making when considering albumin replacement therapy.

Future prospective studies are needed to clarify its role and identify patient subgroups that may benefit from its use.

Patient Safety

52AP01-1

Strange complications of long-term catheters insertion and maintenance

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Background: Central venous catheters are preferred in patients receiving medications that can potentially damage peripheral veins, require vasopressors, need large volumes of fluids, require long-term use, chemotherapy or renal replacement therapy.

Case Report:

Case 1: A 24-year-old male, who has been undergoing hemodialysis for two years, was scheduled for the insertion of a long-term catheter. This procedure is routine in our institution. The left subclavian approach was selected. The procedure was uneventful, and the catheter functioned properly. However, a routine chest X-ray revealed an unexpected finding, leading to the performance of an Angio CT scan. It was determined that selective cannulation of the brachiocephalic vein was required due to a congenital abnormality.

Case 2: A 50-year-old female, following a right hemicolectomy. was referred to our institution for the insertion of a Port-a-Cath. The procedure was successfully performed, and she underwent chemotherapy for six weeks. After this period, the catheter suddenly became blocked and ceased to function. An Angio X-ray revealed that the catheter had completely ruptured, with the distal portion having migrated to the right ventricle.

The proximal part was surgically removed. Echocardiography confirmed that the distal part had not embedded into the ventricular wall. The distal portion was subsequently removed in the Cath Lab using an endovascular snare. The procedure was un-

Discussion: Physicians must consider the importance of individualizing patient care and should have a comprehensive understanding of insertion techniques and potential complications. Ultrasound-guided techniques are the preferred method today, especially for inserting intermediate long-term venous cannulas.

- 1. Moir D, Bodenham A. A narrative review of long-term central venous access devices for the intensivist. J Intensive Care Soc. 2018:19(3):236-246.
- 2. Lenz H, Myre K, Draegni T, Dorph E. A Five-Year Data Report of Long-Term Central Venous Catheters Focusing on Early Complications. Anesthesiol Res Pract. 2019; 2019:6769506.

Learning Points:

- 1. Ultrasound-quided insertion followed by diagnostic Angio CT enhances the success of this procedure.
- 2. Knowledge about maintenance and careful usage protocols is crucial to prolong the duration of catheter use.

52AP01-2

From facilitating practician to perioperative clinician: the importance of multi-speciality input and shared decision making for optimal patient-centred outcomes in anaesthesia

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Background: Multi-speciality input (MDT) and shared decisionmaking (SDM) are crucial for safe anaesthesia. This case exemplifies such approach in delivering patient-centred care in frail patient with retrosternal goitre and associated tracheal deviation. Case Report: Staging CT revealed incidental large retrosternal goitre with tracheal deviation. Risk stratification for potential airway obstruction on administration of anaesthesia was identified via surgical & anaesthetic MDT. Extensive discussions with patient & family were had regarding risk vs benefit.

Worst-case outcomes discussed- challenging intubation/extubation, ICU admission, Patient-centred quality of life outcomes acknowledged. As identified by surgical MDT, the patient showed an obstructive breathing pattern on induction due to goitre, which resolved on intubation.

For extubation, patient was in Fowler's position, neuromuscular block fully reversed, awoken under propofol cover. Additional consultant anaesthetist present to assist, team briefed on rapid sequence induction (RSI) in case of airway collapse.

Discussion: Knowledge of airway risk and patient priorities, identified via MDT & SDM, enabled a successful procedure and sameday discharge. Collaborative, patient-centred decision-making empowered the anaesthetic and surgical teams to proceed, with patient-acceptable risk-mitigation strategies and outcomes. It is essential to highlight the impact that effective SDM could have if applied ubiquitously(1).

While several communication models support SDM(2), complex patient pathways with varied clinician buy-in mean that effective SDM is inconsistent in practice(3).

The anaesthetist has unique overview of medical and surgical risks; by reorienting the anaesthetic role from 'facilitating practician' to 'perioperative-clinician,' the true impact of anaesthetic expertise on enabling meaningful SDM & MDT working can be realised.

References:

- 1. NICE CG197;
- 2. cpoc.org.uk/shared-decision-making:
- 3. pubmed.ncbi.nlm.nih.gov/30144968/

Learning Points: Importance of multidisciplinary teamwork and shared decision-making for risk stratification in complex cases for optimal surgical and anaesthetic outcomes; Recognition of the Anaesthetists' unique opportunity to deliver effective, shared decision-making in complex surgical care pathways; Consideration of system-wide ripple-effects of effective patient-centred care: better use of resources, better patient outcomes, higher patient and staff satisfaction.

A long-term change management program to improve compliance with the Safe Surgery Checklist in a Belgian regional hospital

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Background and Goal of Study: The Safe Surgery Checklist (SSC) enhanced patient safety. However, research shows ongoing challenges among OR professionals in using the SSC, with literature reporting low compliance rates. Goals: Improve compliance, identify causes of suboptimal adherence.

Materials and Methods:

Setting: Surgical Day Care Center, 4 ORs, az Sint-Blasius, Dendermonde. Belgium. Closed-record review during 5 study periods (SP). Only end-of-SP results were analyzed. Evaluation of Sign in by surgeon (SI SURG), anesthesiologist (SI ANE), and Time out (TO) and Sign out (SO) by circulating OR nurse.

Inclusion: surgeries under general anesthesia, sedation, or regional anesthesia. Exclusion: emergency surgery, surgeries under local anesthesia, absence of SSC.

Interventions: communication of results to all OR staff; post-baseline survey of nurses on SO issues and improvement suggestions; SP2: PACU-nurses recall circulating OR nurse if SSC is incomplete; SP3: halt communication of results and recall to study compliance decline; SP4: resume communication. Statistical tests: Fisher's exact test at the end of each SP; significance: P<0.05.

Results and Discussion: Baseline TO and SO were suboptimal. Nurses cited lack of time (90.5%), forgetting during replacement (52.4%), and distraction (38.1%) as reasons for poor SO. Improvement suggestions included anonymous reporting (42.9%), selfcontrol (33.3%), and public reporting (23.8%). SI ANE, TO, and SO significantly improved during SP1. During SP2. TO and SO continued improving despite circulation nurses' poor recall. PACU nurses reported aggressive behavior and social pressure, leading to recall omission in subsequent SP. SP3, with halted communication, resulted in non-significant declines in SI SURG, TO, and SO. Resuming communication in SP4 slightly improved SI SURG, TO, and SO.

Disable period -	Timing	Intervention	N	Sign in	Sign in.	Tiese Out .	Tigh Out
Sexcine	Feb 2029	Compliance milliouriment Communication of results Survey numes: why is Sign Dut the problem, improvement suggestions	128	11.7%	91.29	826	800
W1	iun 2019 to kine 2020, morthly	Compliance measurement Communication of results	304	36.7%	\$6-0.000	9735 9-5.0003	9-36
M.S.	Jen 2021 to June 2023, months	Compliance measurement Communication of resurts Receil crossiting nurse when SVC not DX.	171	95.4%	102%	(p-0004)	17.15 pressi
593	Apr 2022 to 0ct 2021, semestrial	Compliance measurement Step communication Step receil	255	91.54	99.2%	1100	54.3%
10-4	Apr 2008 to Apr 2024, secreptive	Compliance measurement Resignet commercianism of results	261	THE	00.2%	3676	36.7%

Conclusion(s): Repetitive measurement and communication can enhance compliance with the SCC beyond published outcomes. Interrupting communication leads to decline. SO is the hardest to optimize, often due to time constraints or being overlooked, particularly when replaced. Some interventions failed due to resistance and social pressures.

52AP01-4

Association between patient safety culture and incidence of patient falls in postoperative period

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Background and Goal of Study: Patient falls in the postoperative period is a significant problem, often leading to restricted mobility, anxiety, and depression, as well as increased healthcare costs for treatment and rehabilitation of fall-related injuries. Although prevention programs are implemented, their effectiveness largely depends on the level of patient safety culture among healthcare staff.

This study aimed to assess the correlation between safety culture levels and the frequency of postoperative patient falls.

Materials and Methods: The study was conducted in ICU and surgical departments of a multidisciplinary hospital, JSC "Medicina" in Moscow, Russia, from 2014 to 2020. Patient safety culture was assessed using the SOPS Hospital Survey 1.0 (HSPSC), and fall frequency was measured from online staff reports.

Correlation analysis was used to examine associations between fall frequency and safety culture composites, with significance set at p < 0.05.

Results and Discussion: The analysis included fall rate per 1,000 bed days, categorized by injury severity. Significant correlations were found between fall frequency and several safety culture composites: teamwork (-0.826, p=0.022), learning from errors (-0.747, p=0.049), leadership support (-0.760, p=0.047), overall perception of safety (-0.821, p=0.024), incident reporting frequency (0.782, p=0.038), communication openness (-0.846, p=0.017), inter-unit collaboration (-0.867, p=0.012), handoffs and transitions (-0.791, p=0.034), nonpunitive response to errors (0.838, p=0.019), and overall safety culture score (-0.809, p=0.027).

The correlation between teamwork and fall rate may reflect the importance of collaborative efforts in fall prevention. Studies underscore teamwork as essential to patient safety, with training on communication shown to reduce adverse events.

Additionally, the inverse correlation with handoffs emphasizes the role of implementation of different safety instruments such as bedside shift reports in identifying safety risks, with evidence suggesting that this practice reduces fall rates.

Conclusion(s): This study confirms that evaluating safety culture is vital to fall prevention in postoperative period. Higher safety culture levels correlate with fewer falls and injuries, suggesting that safety culture could be an indicator of effective fall prevention measures in healthcare. These findings are valuable for professionals focused on enhancing patient safety.

When tranexamic acid goes intrathecal: understanding the impact and solutions

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Background: An alarming number of cases involving inadvertent intrathecal administration of tranexamic acid (TXA) have been reported. The management of this life-threatening emergency largely relies on evidence from published case reports. Here, we present our experience and discuss preventive strategies to mitigate such errors.

Case report: A 59-year-old man was scheduled for total knee replacement under combined spinal-epidural anesthesia. After administration of the local anesthetic (LA), the patient reported perineal discomfort and developed generalized myoclonic movements. A look-alike error occurred, where the ampoule of TXA was mistaken for LA, leading to the intrathecal administration of TXA. Despite the use of three anticonvulsants, seizures only partially abated, necessitating mechanical ventilation. The surgical procedure was canceled, and the patient was transferred to the neuro-intensive care unit (ICU) with persistent light refractory tonic-clonic thoracic jerks and electrical instability.

Management included sedation with propofol and dexmedetomidine, optimization of anticonvulsant dosages, and the addition of dexamethasone and lacosamide. The patient developed nosocomial pneumonia, which delayed extubation by four days. He was discharged from the ICU after six days. Six months later, he reported persistent shoulder pain but no other complications.

The management approach was primarily supportive, focusing on controlling refractory seizures, arrhythmias, and pneumonia. Dexmedetomidine was used to manage tachycardia, while lacosamide served as an additional anticonvulsant, and dexamethasone was administered to reduce potential edema.

Discussion: Preventing such errors is critical. Double-checking medications should remain a standard practice, while manufacturers should prioritize redesigning ampoules to prevent lookalike errors.

Additionally, TXA should be stored separately from LA. This case adds to the growing body of literature on intrathecal TXA management, highlighting the importance of awareness and preventive measures to avoid this potentially fatal drug error.

Reference:

Patel, S. Tranexamic acid-associated intrathecal toxicity during spinal anaesthesia: A narrative review of 22 recent reports. European Journal of Anaesthesiology 40(5):p 334-342, May 2023

Learning points: Recognizing the Clinical Consequences of Intrathecal TXA; Prevention Strategies; Raising Awareness Among Healthcare Providers

52AP01-7

Impact of ozempic use on preoperative assessment: role of gastric ultrasound in risk stratification for bronchoaspiration

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Introduction: Semaglutide (Ozempic), a GLP-1 receptor agonist, slows gastric emptying, increasing the risk of residual gastric content and, consequently, aspiration – a perioperative complication with high mortality. While the ASA recommends stopping semaglutide 7 days before elective surgery, recent evidence questions the adequacy of this interval. Gastric ultrasound emerges as a vital tool to assess gastric content in real-time, enabling personalized risk evaluation for aspiration and improving anesthetic decision-making in high-risk patients.

Case Report: A 64-year-old male with HTA and type 2 diabetes (on Ozempic, last dose 10 days ago) presents with renal colic. Diagnosed with left renal lithiasis requiring double-J-stent placement. Despite fasting for 10 hours, we performed a gastric ultrasound, showing significant gastric content. Because of this, we decided to perform rapid sequence intubation instead of sedation.

Discussion: This case challenges the adequacy of fasting guidelines in semaglutide-treated patients, suggesting a literature revi-

- 1. Risks of Semaglutide Use: Up to 40% of patients on semaglutide exhibit elevated residual gastric contents, significantly increasing aspiration risk even after proper fasting.
- 2. Current Recommendations' Limitations: A 7-day discontinuation may be insufficient for optimal gastric emptying, However, this statement cannot be generalized to all patients, as there is no solid evidence, which may lead to unnecessary delays.
- 3. Role of Gastric Ultrasound: Ultrasound enables identification of gastric content, personalizing aspiration risk stratification in perioperative management. Ultrasound-Based Strategies:
 - 1. Elevated Residual Gastric Content: Delay elective surgery, use prokinetics, or perform rapid sequence intubation in emergencies.
 - 2. No Elevated Residual Gastric Content: Use standard anesthesia without delays.

Conclusion: This case underscores the need for personalized perioperative risk assessment in patients treated with semaglutide or other GLP-1 agonists, due to the increased risk of aspiration even after recommended fasting periods.

Gastric ultrasound stands out as a fundamental tool for guiding critical anesthetic decisions, suggesting that discontinuation of semaglutide for more than 7 days may be necessary in high-risk patients

Promoting its use in the perioperative setting could enhance patient safety and optimize surgical outcomes.

Improving clarity in summoning emergency assistance to theatres at the Royal Bournemouth Hospital: a quality improvement project

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Background: Effective response to emergencies in theatres is critical for patient safety. The importance of having a standard procedure to call for help in emergencies, that is understood by all staff and clearly displayed, has been highlighted by the Royal College Of Anaesthetists in the 7th National Audit Project and their Guidelines for the Provision of Anaesthetic Services^{1,2}. A recent change in the hospital's communication system, including the removal of the 'fast bleep' functionality, created confusion among theatre staff regarding how to summon emergency assistance.

Objective: To improve clarity and knowledge of the escalation policy during emergencies in theatres both in and out of hours at RBH.

Methods: A questionnaire was distributed to all theatre staff to assess their understanding of emergency escalation protocols.

Results: 85 responses were obtained from a range of theatre staff. Results revealed that 60% of staff relied on the obsolete 'fast bleep' system during hours, and only 40% knew to activate a medical emergency call out of hours, with 6% of staff unsure how to summon help.

Discussion: This questionnaire highlighted significant knowledge gaps, with many staff relying on outdated methods or being unsure how to call for help, particularly out-of-hours. Educational posters detailing correct emergency procedures for in-hours and out-of-hours emergencies were developed and prominently displayed in all theatres and anaesthetic rooms.

Two weeks post-intervention, the original questionnaire will be redistributed to assess improvement in staff knowledge. It is hypothesised that the intervention will result in a higher percentage of correct responses, indicating improved understanding of emergency protocols.

Conclusion: This project aims to address a critical gap in emergency response readiness within theatres by standardising communication procedures, thereby reducing response times, minimising cognitive load for staff, and by proxy improving outcomes for patients in emergencies.

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52AP01-9

Process management in renal transplantation for a case series at Hospital La Fe

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Background and Goal of Study: Spain is the country in the world where most transplants are performed, with renal transplantation being the most frequent. Process management in anesthesia refers to the organized and systematic approach to managing all phases of anesthetic care. This management involves coordinating resources, personnel, tools and clinical practices in a way that optimizes patient safety, minimizes risks and ensures efficiency in each phase of the anesthetic process.

Materials and Methods: Our study included 70 renal transplant patients over a period of 6 months. After the implementation of the protocol, all patients on the Surgical Waiting List are scheduled for anesthesia consultation, with an average delay of one month

Results and Discussion: Thanks to the organization system developed, the patient no longer comes to the hospital as an emergency patient without preoperative tests. An appointment is made when the patient enters the surgical waiting list, making it possible to carry out an adequate pre-anesthetic assessment, which allows, among other things, the evaluation of the airway and identification of possible risks derived from the underlying pathology, as well as a detailed explanation of the process to the patient.

As regards intraoperative procedures, protocols have been developed on standard monitoring, management of the most frequent complications, such as difficult airway, complications related to vascular access, hemorrhage, hyperkalemia or arrhythmias, and acute postoperative pain, with patients being followed up by the hospital's acute postoperative pain unit.

Conclusion(s): Thanks to a pre-anesthetic assessment, it was possible to foresee a difficult airway in 50% of the intubations. Ninety-three percent of the patients were referred to the PACU and 7% to Resuscitation, with an average stay of 3h in the PACU and 2.5 days in Resuscitation, thus guaranteeing exhaustive surveillance in the immediate postoperative period. All this guarantees patient safety and reduces the incidence of adverse events related to the anesthetic procedure.

52AP01-10

Factors for the occurrence of postoperative respiratory pauses: prospective observational study

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Background and Goal of Study: Respiratory depression is a significant cause of morbidity and mortality after surgery. Typically, only oxygen saturation (SpO2) is measured to monitor respiration in the post-anaesthesia care unit (PACU). A drop in SpO2 is a late indicator of respiratory depression and can be masked by oxygen

administration (1), potentially causing further dangerous respiratory pauses after transfer to a general ward and discontinuation of oxygen therapy. This study aimed to record respiratory pauses in the post-operative phase and identify risk factors.

Materials and Methods: We observed 80 non-critically ill patients (ASA ≤ 3, median age 61.5 years) after elective surgery under general anaesthesia (40 patients underwent total intravenous anaesthesia (TIVA) with propofol, 40 had balanced anaesthesia with propofol/sevoflurane). Upon arrival in the PACU, thoracic excursions were recorded for 25 minutes using a chest strap. Patient characteristics and medications were extracted from anaesthesia records.

Results and Discussion: In 33 of 80 patients, respiratory pauses lasting more than 10 seconds occurred (17 balanced group, 16 TIVA group). Both the number (p=0.004) and total duration of respiratory pauses (p=0.011) were significantly increased after TIVA (Fig. 1). No significant correlation was found between frequency or duration of respiratory pauses and postoperative opiates, mean MAC of sevoflurane (balanced group) or weight-adjusted propofol rate (TIVA group). The amount of opiates as morphine equivalent per body weight and time also did not correlate significantly with respiratory pauses.

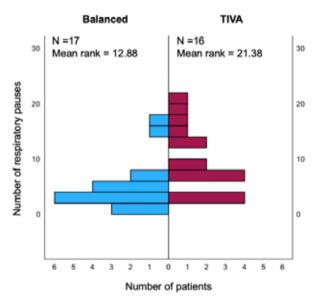


Fig.1: Frequency of respiratory pauses after TIVA and balanced

Conclusions: Relevant respiratory pauses were recorded in about 40% of patients. These often remain undetected and do not necessarily cause a sharp drop in SpO2. Respiratory pauses could not be reliably predicted based on anaesthetic medication. Monitoring respiratory function beyond SpO2 in the PACU may be essential for identifying postoperative respiratory pauses and improving patient safety.

References:

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52AP02-1

Medication errors, a preventable patient harm cause?

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Background: Medication errors are a leading preventable cause of patient harm, often involving incorrect drug selection, dosing, administration routes, or patient identification. These errors affect approximately 6.5 per 100 hospital admissions. Reporting incidents and implementing prevention strategies are critical to minimizing their occurrence.

Case Report: We describe the case of a 55-year-old heart transplant recipient who was approaching extubation, managed without hypnotics or neuromuscular blockers, while receiving norepinephrine, dobutamine, and morphine for pain control.

Just post-extubation, he became unresponsive, desaturated to 60%, and required reintubation, not needing any induction drugs. Suspecting a medication error, naloxone was administered without effect, but sugammadex restored movement and responsiveness.

Further investigation revealed an unlabelled syringe and an empty rocuronium vial, supporting the idea of a medication error. The patient reported being conscious during the event but unable to

Discussion: Medication errors rank among the top causes of patient harm globally. They often occur during prescribing, ordering, or administration, exacerbated by factors like age, polypharmacy, comorbidities, and system inefficiencies. These errors lead to adverse outcomes such as increased hospitalizations, extended stays, elevated costs, and higher mortality rates. Healthcare professionals face legal, ethical, and disciplinary repercussions for errors, emphasizing the need for vigilance and interprofessional collaboration. Strategies such as surgical checklists, medication reconciliation, and verifying verbal orders are effective when supported by a culture of safety and error reporting. Tools like root cause and failure mode effect analysis are pivotal in identifying and addressing systemic weaknesses, ultimately reducing the risk of future errors.

References:

Tariq RA et al. Medication Dispensing Errors and Prevention. [Internet]. StatPearls Publishing; 2024. Available: https://www. ncbi.nlm.nih.gov/books/NBK519065/

Rodziewicz TL et al. Medical Error Reduction and Prevention [Internet]. StatPearls Publishing; 2024 Available: https://www. ncbi.nlm.nih.gov/books/NBK499956/

Learning Points: Safety culture, teamwork, and proactive tools like root cause analysis are key to reducing medication errors. Prevention strategies, including medication reconciliation, checklists, and verification, emphasize a systematic approach to patient safety.

52AP02-2

The mini morbidity and mortality conference. A small conference with a big effect on patient safety and staff well-being

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Background and Goal of Study: Health care systems currently suffer from staff shortages and financial pressure while facing an increasing workload. This poses a possible threat to patient safety and staff's health.

We want to present a new and simple method of improving safety culture. Our format, the so-called Mini-M&M-Conferences (mMMC), in comparison to traditional M&M-Conferences, poses a low-threshold and an easy to organize alternative. We postulate the mMMCs can contribute to patient safety and to staff well-being.

Materials and Methods: We implemented the mMMC in the department of anesthesiology in a major University Hospital in Germany. They are an abbreviated version of the classic M&M, where residents, specialists and nurses can report an adverse event (AE) they witnessed or were involved in, in a safe and human space.

The hosts use a shortened London-Protocol to analyze the AEs for organizational factors and the reasons that led to the event. The participants can learn about safety culture, occurrence of AE, human factors and simple CRM-Methods. We accompanied the conferences with a feedback questionnaire. We measured the emotional response of participants with the Self-Assessment-Manikin-Model (SAM), a nonverbal pictorial assessment tool.

Results and Discussion: Over a period of 18 months we held 21 mMMCs with 125 participants. We collected and analyzed 89 cases, 76 of them severe or life threatening. Most common cognitive errors were anchoring, omission and commission bias. There was statistically relevant correlation between anchoring and life-threatening AEs.

We proposed and implemented several security-relevant improvements in the department. E.g. we will change labeling of our syringes to the German standard since 38% of reported AEs were medication errors. We developed a SOP concerning documentation of pediatric cases with continued informed consent, after the same incident with the same patient happened twice. So far, six participants reported they avoided an AE because they attended an mMMC.

SAM-Model-Analysis results indicated significant increases (p<0.0001) across all three variables (Pleasure, Arousal and Dominance). These findings suggest a measurable positive impact on participants' emotional and psychological states.

Conclusion(s): We therefor conclude mMMCs improve patient safety, safety culture and staff well-being. Our concept also might have a positive influence on peer support, for which further research is planned.

52AP02-3

Patient perspectives of Al-based vital sign prediction on general wards: a qualitative study

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Background and Goal of Study: Artificial intelligence (Al)-based prediction of vital sign trends from continuous monitoring data has the potential to improve postoperative patient safety in general wards by enabling early detection of deterioration [1]. This study aimed to gain insights into patients' perspectives on prospective Al-based vital sign prediction, to develop recommendations for future implementation aligned with their needs.

Materials and Methods: Sixteen postoperative patients on a neurosurgical general ward of a German university hospital were included after IRB approval. All patients underwent moderate to severe head or spine surgery and were continuously monitored with a wireless pulse oximeter. Semi-structured interviews were conducted using a guideline developed through literature review, expert focus groups, and test interviews. With an inductive approach, interview transcripts were analyzed by qualitative content analysis in MAXQDA.

Results and Discussion: Patients' acceptance of Al-based vital sign prediction was positively influenced by a perceived increase in quality of care and safety (cf. Figure 1).

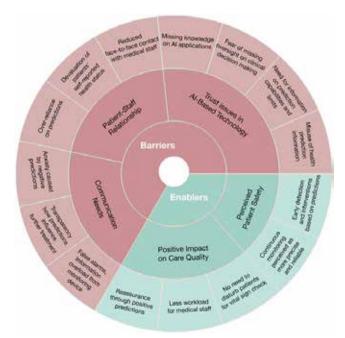


Figure 1: Patient-related barriers and enablers for Al-based vital sign prediction.

Their trust was negatively affected by concerns about the accuracy of predicting individual health conditions, potential misuse of patient data, and the loss of face-to-face interaction with medi-

cal staff. Patients emphasized the need for health professional oversight and accountability in clinical decision-making. Successful implementation of an Al-based vital sign prediction model requires clear communication about prediction consequences. alongside reassurance about data safety and transparency in clinical decision-making.

Our study is limited to neurosurgical patients and a hypothetical vital sign prediction scenario.

Conclusion: The results offer valuable initial insights to engage patients in clinical technology implementation.

Reference:

1. Æ. Ö. Kristinsson et al., "Prediction of serious outcomes based on continuous vital sign monitoring of high-risk patients," Comput. Biol. Med., vol. 147, p. 105559, Aug. 2022, doi:10.1016/j. compbiomed.2022.105559.

52AP02-4

The incidence and risk factors for post-induction hypotension in obese patients

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Background and Goal of Study: Post-induction hypotension (PIH) is a common complication associated with an increased postoperative risk. The incidence and severity of PIH in obese patients varies owing to unique physiological and pharmacokinetic factors. This study aimed to determine the predictors of PIH in obese patients.

Materials and Methods: This single-center retrospective cohort study included the medical records of 4,973 patients with a BMI >30 who underwent non-cardiac surgery between September 1, 2018, and September 1, 2023. PIH was defined as a mean arterial pressure (MAP) <60 mmHg within 10 min of induction. Multivariable logistic regression was used to assess risk factors for PIH.

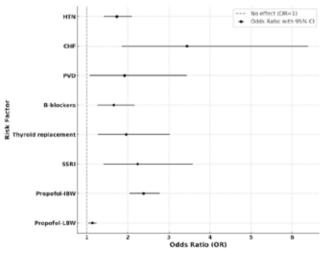


Figure 1. Risk factors of PIH.

Results and Discussion: The study included 3090 (60.3%) patients with class I, 1286 (25.1%) with class II, and 752 (14.6%) with class III obesity, with PIH incidence rates of 25.4%, 25.9%, and 22.5%, respectively. There were no statistically significant differences between obesity classes; therefore, risk factor analysis was performed across all groups combined. The significant predictors of PIH included hypertension (odds ratio [OR] 1.73, p<0.001), congestive heart failure (OR 3.44, p<0.001), and peripheral vascular diseases (OR 1.92, p=0.028). Medication-related risks included the use of beta-blockers (OR 1.66, p<0.001), thyroid-replacement therapy (OR 1.96, p=0.002), and selective serotonin reuptake inhibitors (OR 2.24, p<0.001).

Across anesthesia-related factors, propofol dose for anesthesia induction according to ideal body weight (OR 2.38, p<0.001) and lean body weight (OR 1.14, p=0.003) were significantly associated with PIH.

Propofol dose, mg/kg	no PIH	PIH	P-value
TBW	1.38 (0.53)	1.56 (0.58)	<0.001
IBW	2.07 (1.01)	2.4 (1.21)	<0.001
LBW	2.19 (1.66)	2.61 (1.91)	< 0.001

Table 1. Propofol dose for induction in anesthesia

Conclusion(s): Several perioperative and medication-related factors were significant predictors of PIH in obese patients, emphasizing the need for tailored hemodynamic strategies to minimize PIH risk in this group.

52AP02-5

Surgical productivity change after workstyle reform for doctors in Japan

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Background and Goal of Study: Workstyle reform for doctors is a priority of Japanese labor policy, which capped the legal overtime of doctors. New regulations for workstyle reform were applied to all fully licensed physicians in Japan on April 1, 2024 (Ref 1). The long work hours of doctors adversely affect their health and increase the risk of medical errors (Ref 2, 3). The goal of this study is to determine the surgical productivity change before and after the implementation of the workstyle reform using a Malmquist index (MI) model. We hypothesized that the workstyle reform for doctors would significantly increase their surgical total factor productivity by reducing the risk of medical errors and by improving doctors' health.

Materials and Methods: We collected data from the surgical procedures performed at Teikyo University Hospital from April 1 through May 31 in 2023 and in 2024.

MI represents the dynamic productivity change of a decisionmaking unit (DMU) between two time periods; it is an example of comparative statics analysis. MI can be used to divide the productivity change into two components: efficiency change (EC) and technical change (TC). We used a non-radial and non-oriented Malmquist model under variable return-to-scale assumptions. A DMU was defined as a surgeon with the highest academic rank in surgery. The inputs were the number of medical doctors who assisted the surgery, as well as the duration of the surgery from skin incision to closure. The output was the surgical fee. We defined in this study 2023 as "before workstyle reform" and 2024 as "after workstyle reform."

All surgeons in the sample were assigned MI, EC, and TC values; their natural logarithms were calculated to allow interpretation as percent changes. The natural logarithms of MIs, ECs, and TCs for surgeons were compared against 0 using t-tests. P-values < 0.05 were considered statistically significant.

Results and Discussion: We analyzed 1,557 surgical procedures performed by 72 surgeons from April 1 through May 31 in 2023 and in 2024. There was no statistically significant difference from 0 in productivity, efficiency and technical changes (TABLE).

Conclusion(s): No evidence was found to suggest that the workstyle reform for doctors increased their surgical total factor productivity in Japan.

References:

- 1. Tsutsumi A. Environ Occup Health Practice 2020; 2: doi:10.1539/eohp.2020-0008-OP
- 2. Lockely SW, et al. N Engl J Med 2004; 351:829-37
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Acknowledgements: This study was supported only by institutional resources at Teikyo University.

	Change from 2023 (before workstyle reform) to 2024 (after workstyle reform)
Productivity change (%)	-6.5 ± 7.5
Efficiency change (%)	-7.6 ± 7.5
Technical change (%)	+1.2 ± 1.2

The values are expressed as mean ± SE.

No values are significantly different from 0 (p > 0.05).

Table. Percent changes of productivity, efficiency, and technique.

52AP02-6

Intraoperative migration and entrapment of an esophageal temperature probe during laparoscopic sleeve gastrectomy: a case report

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Background: Laparoscopic sleeve gastrectomy (LSG) is a prevalent bariatric surgery for managing obesity. Despite its efficacy, complications can arise from intraoperative devices such as esophageal thermometers, nasogastric and orogastric tubes. (1) We report a case where the temperature probe migrated intraoperatively into the stomach and was inadvertently stapled across while performing this type of surgery.

Case report: A 45-year-old female, ASA III, with obesity (BMI: 35.54 kg/m2) and undifferentiated connective tissue disease presented for elective LSG. Standard ASA monitoring was used, including the placement of a reusable thermometer in the proximal esophagus through the mouth. During the procedure, this device migrated into the stomach and was inadvertently stapled across the gastric sleeve. This required additional surgical intervention to remove the severed device segments and repair the damage with manual sutures. A methylene blue leak test confirmed the absence of leakage. The patient's postoperative recovery was uneventful, leading to discharge without further complications.

Discussion: The case presented involves the migration and section of an esophageal thermometer during LSG, highlighting a preventable complication. This situation is contrasted with similar cases reported in the literature to underscore the importance of

ensuring the effective communication between surgical and anesthetic teams, proper placement and continuous monitoring of intraoperative devices, to prevent similar complications. (2) Reporting this avoidable incident aims to raise awareness of the appropriate precautions needed when positioning intraoperative devices.



References:

- 1. Wass CT, et al. Entrapment of a nasopharyngeal temperature probe: an unusual complication during an apparently uneventful elective revision laparoscopic Nissen fundoplication. Dis Esophagus. 2010;23(1):33–35
- 2. Guru GK, et al. Temperature probe entrapment during laparoscopic sleeve gastrectomy: a preventable complication. Clin Surg J. 2021;2(4):1–4

Learning points: Complications from intraoperative device migration and entrapment during bariatric surgery, while rare, are significant and preventable.

52AP02-7

Impact of a novel Electronic Health Recordintegrated Ward Round proforma on documentation completeness and clinician experience in the intensive care unit

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Background and Goal of Study: The ICU ward round (WR) is central to promoting safe and timely decision-making in intensive care units (ICUs). Consensus statements from Royal Colleges emphasise the importance of structured WR documentation. Inconsistencies in documentation present clinical and medicolegal challenges.

Electronic health records (EHRs) enhance documentation efficiency through proformas. We implemented a novel EHR-integrated WR template in a tertiary ICU in the UK, evaluating its impact on WR documentation completeness, and surveying clinician experience.

Materials and Methods: A single-centre audit of ICU WR documentation across three, one-month cycles between January - September 2024 (where cycle 1 is pre-implementation). The proforma utilised automated data population for vitals, organ support, key medications and blood test results and a FLATCH-

UGs checklist. We identified poorly-documented areas (bowel opening, glycaemic control, line assessment) and dynamically designed electronic prompts within our proforma. Parameters analysed were based on international guidelines and validated by senior intensivists.

Surveys of ICU clinicians before and after template implementation evaluated user satisfaction and time efficiency.

Results and Discussion: 86 WR notes were audited (Cycle 1: n=29: Cycle 2: n=30: Cycle 3: n=27). The proforma significantly improved documentation completeness across above interventions; confirmed by a paired t-test, t(5) = 4.31, p<0.0077, mean difference of -45.117 (95% CI; -72.1 to -18.2). Documentation of the following improved:

- Bowel opening (from 55% to 90%).
- Glycaemic control (from 3% to 50%).
- Line review (from 7% to 27%).
- FLATCHUGS checklist completion (from 14% to 100%).

Surveys from ICU clinicians (5-point Lickert) revealed improved satisfaction (2.6 to 4.5, where 5 is most satisfied), ease of use (2.6 to 4.33, where 5 is easiest to use), and reduced documentation time (23.7 to 17.5 minutes per review).

Conclusion: We demonstrate the utility of structured EHR proformas with automated data population, prompts, and checklists, in significantly enhancing completeness of WR documentation. Real-time data entry reduces "cut/paste" practices often seen in EHRs, improving patient safety, medicolegal robustness, and addressing ICU-specific needs e.g. CAM-ICU, FLATCHUGS. Future research should explore the role of EHR-proformas on other important aspects of ICU documentation.

Acknowledgement: Additional co-author: S.M. Kellv¹

52AP02-8

The role of respiratory rate monitoring: a scoping review of early detection of clinical deterioration and mortality

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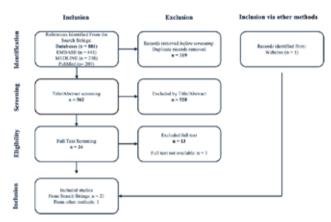
Background and Goal of Study: Respiratory rate (RR) is a key vital sign to assess patient health and predict clinical deterioration. Despite its importance, RR is often underutilised. This scoping review aims to examine the existing evidence on intermittent and continuous RR monitoring in hospitalised adults.

Materials and Methods: A systematic search was conducted using Medline Ovid, EMBASE Ovid, and PubMed. Studies focusing on the impact of RR monitoring compared to either no measurement or less frequent manual measurements in adult patients were included.

The primary outcomes were clinical deterioration and mortality. RR monitoring was compared with early warning systems, organ dysfunction scores, and standard care. Thematic synthesis was used to map the available evidence.

Results and Discussion: Twenty-one studies met the inclusion criteria. Elevated RR, particularly when sustained over time, was associated with severe outcomes such as ICU admission and mortality.

All studies reported a significant correlation between RR and deterioration, but no single vital sign consistently excelled across all patient populations or conditions. The predictive utility of RR improves when combined with other physiological measures. Continuous RR monitoring was found to enhance the detection of tachypnea and respiratory abnormalities compared to intermittent assessments, facilitating earlier identification of deterioration and potentially improving patient outcomes. However, proper implementation is needed to adjust alarm thresholds, minimizing alarm fatigue from false positives.



References:

Sol Agnete Stene Aglen, University of Bergen Henriette Flesland Simonsen, University of Bergen Supervisor: Ib Jammer, Haukeland University Hospital

Conclusion(s): RR monitoring is essential for early detection of clinical deterioration and mortality, particularly when integrated into early warning systems. Continuous RR monitoring proved more effective than intermittent methods in predicting worsening condition. Furthermore, emerging technologies that enable continuous monitoring could contribute to more sustainable healthcare by improving efficiency and patient safety.

52AP02-9

One-year outcome in patients undergoing postponed elective surgery during the COVID-19 pandemic (TRACE II)

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Background and Goal of Study: The COVID-19 pandemic greatly impacted the capacity of elective surgery, which resulted in the delay of elective surgical procedures. It was hypothesized that this would result in worse outcome. The TRACE II studied the effects of delayed surgery on clinical and patient reported outcome measures until 1 year after surgery.

Materials and Methods: TRACE II, an observational, multi-centre, prospective cohort study among surgical patients with postponed elective surgery due to COVID-19, was performed in seven academic and non-academic hospitals in the Netherlands between September 2020 and February 2023 (1).

Results were compared with the control group of the pre-COVID TRACE study (2).

Clinical outcome measures included one-year mortality, hospital readmission and re-operation. Functional recovery measures included patient reported Global Surgical Recovery (GSR) and Activities of Daily Living (ADL). Pain was measured using the NRS (Numeric Rating Scale) and Quality of Life (QoL) using the EQ-5D-5L. We used Fisher's exact tests to check for differences in distribution of categorical variables between the two cohorts, and Mann-Whitney U tests for comparison of non-normally distributed continuous variables.

Results and Discussion: A total of 1479 patients were included in TRACE II and compared to 2490 control patients from TRACE. One-year mortality was lower in TRACE II compared to TRACE (33 (2.5%) vs 133 (5.4%); p<0.001). There was no significant difference in readmission or re-operation between the cohorts. Patient reported recovery and ADL scores were lower in TRACE II, and median pain scores were higher. The median quality of life using the EQ-5D-5L at 1 year was 0.82 (IQR 0.70-1.0) in TRACE II patients compared to 0.86 (IQR 0.75-1.0) for patients in TRACE; p<0.001. Multivariate regression analyses and subgroup analyses will be presented at Euroanaesthesia 2025.

Conclusion(s): In contrast to our hypothesis, patients undergoing delayed elective surgery in the COVID-19 pandemic had a decreased one-year mortality. No other differences in clinical outcome were observed. These patients did, however, have significantly poorer patient reported outcomes in functional recovery, pain and QoL.

References:

1. Werger AC et al. BMJ Open 2022;12: e060354. (2) Buhre WFFA et al. Ann Surg. 2021 May 24.

Acknowledgements: We would like to thank the TRACE Study investigators and the participating centres for their support in conducting both studies.

52AP02-10

Intraoperative mortality, a five years analysis at a Tertiary University Hospital

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Background and Goal of Study: Intraoperative mortality has decreased in recent decades and is now rare, and hard to quantify, 0.5–1 per 100,000 operation (1). Nevertheless it remains a robust indicator of patient safety in the surgical environment. Analyzing each event should be mandatory to review factors that could be modified or optimized to assure that deaths in the operating room are only those unavoidable.

Materials and Methods: Since 2019, the Surgical Area "safety commission" of our Spanish tertiary University Hospital, prospectively review and analyze any reported intraoperative death. The review is done as soon as possible. The surgical and anesthetic charts, patient past and actual pathologies are obtained from the

electronic records. Interviews with the involved health care professionals are done with a debriefing technique. Opportunities for improvement are sought.

Results and Discussion:Intraoperative deaths are scarce, and the majority occur during urgent surgeries. But one scheduled patient per year, at our institution, can have a non-expected severe intraoperative complication. Hemorrhagic shock is the leading ultimate cause.

Year	Scheduled surgery	Intraoperative Death	Urgent surgery	Intraoperative death
2019	17129	2 (0.01%)	6318	8 (0.13%)
2020	14236	0	5834	10 (0.17%)
2021	18637	1 (0.01%)	10161	5 (0.05%)
2022	15032	1 (0.04%)	5052	9 (0.19%)
2023	15748	1 (0.01%)	6116	3 (0.01%)

Multidisciplinary analyzed as sentinel cases, the intraoperative deaths triggers several actions to improve. Some examples are: Increase the accomplishment of the safety surgery check list; to avoid overlapping of vascular surgeries that may require specific instrumentation; improve hand over and the coordinate performance of explorations in polytrauma patients; consider not operating as an option in severely fragile; Standardizing access to aid for any suspect second victim.

Conclusion(s): Safety committees help to detect situations that may have led to non-resolution of avoidable intraoperative complications.

References:

- Lancet Reg Health West Pac. 2023 May 15;37:100787. doi: 10.1016/j.lanwpc.2023.100787. PMID: 37693877; PMCID: PMC10485673.
- 2. Anesthesia & Analgesia 127(3):p 730-735, September 2018. | DOI: 10.1213/ANE.000000000003483

52AP02-11Patient positioning matters

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Background:

Anesthesiologists have the duty of checking patient positioning during surgery as malpositioning is associated with neural, vascular, joint or bone lesions. There are several reports concerning this situation but this abstract describes an unusual and rare situation.

Case Report:

We describe a 48 yo male obese patient (125 Kg, 170 cm, BMI 42 Kg/m², ASA III) with past history of uncontrolled hypertension and type 2 diabetes, submitted to an elective robotic bariatric surgery (gastric bypass) that lasted 6 hours in extreme reverse Trendelenburg position under general anesthesia. The legs were positioned on a specific support with an intermittent pneumatic compression system and a ligature securing both limbs. The surgery, although laborious, went uneventful. Twelve hours later the patient complained with intense acute pain in both legs.

Examination findings revealed swell and tense legs. After clinical observation it was ruled out DVT and compartment (well leg) syndrome was diagnosed with creatine phosphokinase, myoglobin and serum potassium elevation. The patient was transferred

immediately to OR and fasciotomies were done under general anesthesia. The post-operative period in the ICU was markedly characterized by hemodynamic instability, acute kidney disease. hepatic failure, electrolyte imbalances, hyperactive delirium/encephalopathy, anemia and thrombocytopenia. Fasciotomies were closed 14 days after the first surgery.

During the ICU stay that lasted 30 days, the patient went through continuous hemodiafiltration and even after discharge to the nursery the patient remained under intermittent dialytic replacement therapy with persistent elevated CK myoglobin and creatinine measurements. Thirty-nine days after the elective procedure the patient was discharged.

Discussion:

Measures to decrease the likelihood of developing well-leg syndrome must be implemented: relieving excessive pressure on the lower leg contact area, horizontally repositioning the operating table every 3 hours, decompressing the contact area of the lower leg during the operation and maintaining normal blood pressure during surgery. This case highlights the importance of patient positioning before but mostly during prolonged surgeries as serious consequences can emerge after the anesthetic period (1,2).

1. Nester, M.; Borrelli, J., Jr. Well Leg Compartment Syndrome: Pathophysiology, Prevention, and Treatment. J. Clin. Med. 2022, 11, 6448.

52AP03-1

Improvement of treatment quality through cognitive aid eGENA in in-situ case simulations

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Background: Since the introduction of the electronic memory and decision aid for emergencies in anaesthesia (eGENA) by the DGAI and the BDA 2020 [1], there has been little data available that demonstrates possible changes in treatment through its use. The aim of this study is to further analyze and describe the quality of treatment with and without the support of eGENA in the context of in-situ case simulations in a pilot clinic.

Methods: 28 cases were processed in 14 training groups, each with 4 participants. The order of the two scenarios, the release of eGENA during the scenarios and allocation of participants were randomized. 37 doctors (10 specialists and 27 residents) and 19 nurses (7 ATAs, 7 specialized nurses and 5 nursing staff) took part in the simulations. The scenarios were standardized in terms of case progression. The quality of treatment in the simulations was assessed using a previously defined 20-point evaluation form, which was divided into 10 resuscitation-related and 10 caserelated points. Statistical analysis was performed using paired Ttests or Wilcoxon tests depending on the normal distribution, with a significance level of p < 0.05.

Results and Discussion: Both scenarios showed comparable case complexity (14.86 vs. 15.36 pts. out of 20, n.s.). Physicians used eGENA ten times, nurses twice and twice jointly by both professional groups. The use of eGENA resulted in higher caserelated scores (7.43 vs. 5.14 of 10, p=0.004) and higher total score (16.36 vs. 13.86 of 20. p=0.008). There were no significant differences in CPR-related scores (8.93 vs. 8.71 of 10). The use of eGENA led neither to delays nor to acceleration of resuscitation measures. With eGENA, differential diagnoses were discussed significantly more frequent and extended therapeutic and diagnostic measures were used more often, including optimisation of positioning, consideration of contraindications and extended medication.

Conclusions: In this study, eGENA was primarily used by physicians. The use of eGENA led to comparable resuscitation quality without a time delay. With use of eGENA, better case-related results were achieved. In complex emergency situations, extended diagnostic and therapeutic measures were implemented more frequently, thereby increasing the overall quality of treatment. Further studies with larger case numbers are required to confirm the observed effects.

References:

1. Neuhaus C et al: Functionality and Operation of eGENA, Anästh Intensivmed 2020

52AP03-4

Improving safety in local anaesthetic dosing for elective lower limb joint replacements

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Background and Goal of Study: Local anaesthetics(LA) are integral to elective lower limb joint replacements. However,a recent Coroner's report(1)uncovered a fatal case of Local Anaesthetic Systemic Toxicity(LAST) linked to LA dosing miscalculation. This study aims to review current practices in LA dosing and documentation during elective lower limb joint replacement surgeries, identify areas for improvement, and propose strategies to enhance patient safety.

Materials and Methods: After clinical audit registration, a departmental survey was conducted to evaluate practices in LA usage for elective lower limb joint replacements. A retrospective audit also reviewed 87 elective total hip(THR) and knee replacements(TKR) across two hospitals between June-July 2024. The audit collected data on LA volumes used for anaesthetic blocks and surgical infiltration,documentation accuracy,and compliance with safety guidelines. Statistical analysis included descriptive statistics for practice patterns and deviations from safe limits.

Results and Discussion:

- Correct documentation of LA dosing was found in 32% of cases.
- · In one incident, LA dosing exceeded the recommended maximum by 135%, raising concerns about the risk of LAST.
- · 69% of respondents did not use standardised tools for dose calculations, resulting in notable variability in practices.
- · Team communication about LA dosing was inconsistent, with only 54% of respondents reporting that LA doses were always discussed before administration.

Conclusion(s): This study underscores the critical need for clear documentation and standardised practices to prevent LAST. In response, we developed user-friendly LA dosing charts(Figure 1),to calculate the maximum LA dose and determine the safe dose after anaesthetic nerve blocks. Key recommendations inrecommendations.

clude using LA dosing charts, adhering to lean body weight calculations for obese patients⁽²⁾,and implementing mandatory twoperson checks for LA preparation. These findings emphasise the importance of strong communication between anaesthetic and surgical teams to ensure consistent practices,vital for improving safety. Future studies should assess the effectiveness of these

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52AP03-5

Spinal anesthesia in high risk patients: technical complications and management of an accidentally retained needle fragment

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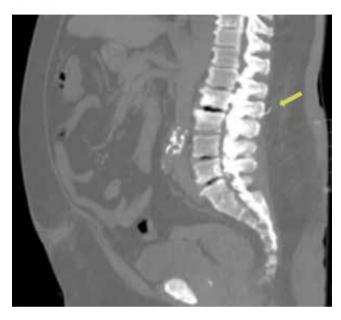
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Background: Intradural anesthesia is commonly used not only as a first choice type of anesthesia in certain surgical procedures but as an alternative to general anesthesia in those patients whose comorbidities imply a higher risk for certain complications associated with the latter.

Case Report: A 54 years old and 250kg male patient was scheduled for perianal abscess drainage. Considering the higher risk for complications associated with general anesthesia, intradural anesthesia was chosen as the best aproach. During the first attempt, the spinal needle fractured (1), and part of it was retained in the muscular and subcutaneous tissue. It was not until after

the second attempt, which was successful, that the surgery was completed without any further complications. Postoperatively, a lumbar CT scan confirmed the exact needle location, and conservative management was decided by a multidisciplinary consensus (2) with the neurosurgical team.

Discussion: This case highlights the dual role of spinal anesthesia, considered a safer option in certain patients and procedures, but not exempt from risk and complications. It, likewise, emphasizes the importance of technical expertise, and collaborative decission making in managing complications during regional anesthesia.



References:

- 1. Shah SJ, Vanderhoef K, Ibrahim M. Broken Spinal Needle in a Morbidly Obese Parturient Presenting for Urgent Cesarean Section. Apan A, editor. Case Rep Anesthesiol. 30 de septiembre de 2020;2020:1-3.
- 2. Benham M. Spinal needle damage during routine clinical practice. Anaesthesia. septiembre de 1996;51(9):843-5. **Learning points:** Spinal anesthesia is not exempt from complications other than the typical ones such as hypotension, but more technical ones which we have to consider too when assessing a patient.

52AP03-6

Ensuring patient safety during sedoanalgesia for bidirectional endoscopy in a patient with severe ankylosing spondylitis: a case report

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Background: Patients with severe ankylosing spondylitis (AS) pose significant challenges in non-operating room anesthesia. Ensuring patient safety can be difficult due to limited mobility, potential airway complications, and comorbidities like osteoporosis.

This case report presents our experience in managing a patient with severe AS undergoing bidirectional endoscopy under procedural sedation, emphasizing critical considerations, including patient positioning and safety.

Case Report: The patient was a 64-year-old male with a history of coronary artery disease, chronic hypertension, anemia, and severe ankylosing spondylitis. The patient was evaluated preoperatively and diagnosed with a difficult airway due to significant spinal stiffness and limited mobility. The indication for bidirectional endoscopy was his elderly age and anemia, aiming to clarify the underlying etiology. Standard ASA and non-invasive end-tidal CO2 monitoring were supplied.

The patient was carefully positioned to minimize strain on his joints, particularly the spine, due to the severe stiffness from ankylosing spondylitis. A total of 2 mg midazolam, 90 mg propofol, and 100 mcg fentanyl were administered for sedation. The team collaborated to tailor the endoscopy and sedation to the patient's needs.













Discussion: Routine patient positioning during endoscopic procedures can be challenging due to spinal rigidity. In this case, an individualized position was chosen to minimize strain on the joints and spine. Airway management was addressed with preoperative assessment and non-invasive monitoring, including end-tidal CO2. Successful outcomes in such patients require careful sedation and positioning, with close collaboration between the procedural and anesthesia teams.

Learning points: Positioning Considerations in Patients with Severe Ankylosing Spondylitis, Individualized Anesthesia Manage-

52AP03-7

Accidental intrathecal administration of 1,500 micrograms of morphine - any side effects?: a case report

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Background: The intrathecal administration of a toxic dose of morphine can lead to life-threatening side effects. This case highlights a critical medication dosing error in which a 10-fold overdose was unexpectedly tolerated without any adverse outcomes, challenging our understanding of opioid pharmacodynamics and underscoring the importance of precise medication management.

Case Report: A 68-year-old male patient, ASA II, was admitted for an elective retropubic radical prostatectomy. Before induction, a subarachnoid injection of morphine was performed for analgesia. The morphine vials at 10 mg/mL required a 100-fold dilution, but only a 10-fold dilution was performed.

Consequently, the anesthesiologist inadvertently administered 1,500 mcg of morphine instead of 150 mcg. This medication dosing error was not recognized immediately, and the procedure continued with a general anesthesia.

The surgery was completed without complications, and the patient remained stable. In the postoperative anesthetic care unit, the team recognized the mistake and implemented appropriate monitoring. The patient was later transferred to a level 2 care unit, where he stayed 24 hours, before being transferred to the ward and then discharged two days later. Remarkably, he did not show respiratory depression, remained pain-free, and normotensive.

Discussion: This case reveals a significant medication dosing error involving a 10-fold morphine overdose administered without adverse outcomes. Research indicates intrathecal morphine overdose can cause severe respiratory depression with delayed onset, particularly above 300 mcg[1].

Despite these risks, the patient remained stable, highlighting individual variability in opioid response. The error was identified postoperatively during team debriefing. This event emphasizes the critical role of closed-loop communication and safety protocols to minimize medication dosing errors. We attribute this error mainly to unclear communication and the absence of a specific intrathecal morphine protocol at the institution.

References:

1. Gehling M, et al. Risks and side-effects of intrathecal morphine combined with spinal anaesthesia: a meta-analysis. Anaesthesia. 2009;64(6):643-651

Learning Points: Medication dosing precision is critical in anesthesia. Individual drug responses vary dramatically. Error recognition, thorough monitoring, and prevention protocols are essential to patient safety and mitigating potential risks during medical procedures.

52AP03-8

The Cappuccini Test: an aspirational standard for anaesthesia supervision

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Background and Goal of Study: Frances Cappuccini, a young mother who passed away following a routine caesarean section, highlighted deficiencies in the supervision of anaesthetists. The Cappuccini Test was developed as a direct response to the coroner's inquest which revealed that the supervision arrangements for the Anaesthetist involved were "undefined and inadequate," with no clear awareness of who was supervising or their availability.

It is a simple, six-question audit tool designed to assess and improve supervision practices in line with the Guidelines for the Provision of Anaesthesia Services (GPAS).

Materials and Methods: The Cappuccini Test was conducted over 6 weeks in 2023 in the anaesthetics department at QEH Woolwich. The test included questions for supervisees regarding identification of their supervisor, the method of contact, and success in reaching them using the method provided by them. Supervisors were also asked to name their supervisees, describe their activities, and confirm availability to attend.

Data from 77 Supervision episodes was collected out of which 90% were on-call activities and 10% theatre lists and analysed descriptively.

Results and Discussion: A total of 77 supervision episodes were recorded. Supervisees demonstrated 99% ability to identify their supervisor, and 90% of supervisors were aware of their supervisee's identity and could describe nature of their work. Successful contact rates were 99%. However, variability was noted across shifts, with gaps in availability during peak hours.

Comparison with a 2020–2021 audit highlighted a marked improvement in supervision practices due to enhanced communication protocols

Conclusion: The Cappuccini Test is a straightforward safety and quality improvement tool, ensuring trainees work in a safe environment with full access to their supervising consultant. It serves as a valuable measure of supervision quality and training standards, representing an aspirational benchmark for enhancing patient safety and care quality in anaesthesia services.

Reference:

The Royal College of Anaesthetists, Cappuccini Test. Available from Cappuccini Test | The Royal College of Anaesthetists(rcoa. ac.uk)

52AP03-9

Operating room fire during carotid endarterectomy: an anesthesia perspective

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Background: Operating room (OR) fires are extremely dangerous and are considered a "never" event, however very rarely they still are reported. We present a case of an OR fire in a patient during carotid endarterectomy, its management and causes.

Case Report: A 72-year-old female, ASA III, was proposed for right carotid endarterectomy due to recent ischemic stroke. After an uneventful induction of intravenous general anesthesia with orotracheal intubation, the surgical incision with an electrosurgical knife started. Few minutes later, a fire was detected below the surgical drapes, involving the patient's ear, hair, and shoulder. The surgical drapes were immediately removed and the fire was extinguished with abundant saline solution. After replacing the electrosurgical knife with a lower intensity and applying gauze pad to the wounds, the surgery was concluded without further incidents. She was awakened and later evaluated by Plastic Surgery and Otorhinolaryngology, which identified second-degree burns which recovered completely with conservative treatment. A debriefing meeting followed to review the incident and reinforce safety protocols.

Discussion: OR fires occur when the "fire triangle" elements are present:

- Fuel: Surgical drapes, alcohol-based antiseptics and patient hair
- Ignition Source: Electrosurgical devices, lasers, or light sources
- Oxidizer: Oxygen and nitrous oxide

The culprits of the fire in this case were presumably insufficient drying of alcohol-based antiseptics, inadequate protection of hair, and proximity of the electrosurgical knife. surgical field not fully applied. The surgical field may not have been fully applied, increasing exposure to ignition sources. Anesthesia considerations for fire prevention include adequate oxygen and fuel management and ignition control. Immediate actions are critical in managing a surgical fire by extinguishing the flames, halting the use of ignition sources, and protecting the patient.

References: Teresa S. Jones, Ian H. Black, Thomas N. Robinson, Edward L. Jones; OperatingRoomFires. Anesthesiology 2019; 130:492–501

Learning points: Despite being uncommon, OR fires are still a constant threat. Insufficient drying of alcohol-based antiseptics can produce a fire. Vigilance is essential in controlling oxygen levels, managing flammable materials, and mitigating ignition risks.

52AP03-12

Error in medication administration: anectine instead of fentanyl

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Background: Drug administration errors occur during the process of prescribing, dispensing or administering medication, and can have a major impact on patient safety. They, unfortunately, occur in 20% of medical administrations1. "To Err is Human: Building a Safer Health System", is a report published in the United States which positioned healthcare-related adverse effects as the seventh cause of death in the country2.

Case Report: A 27 year old male, with no medical history, who undergoes an appendectomy. After he is extubated and the monitoring is removed, he reports pain, so the anesthesiologist requests a vial of fentanyl.

Once administered, the patient seems disoriented and starts experiencing respiratory difficulty. Manual ventilation is needed. No miotic pupils were observed. Anesthesiologist's first thought was a possible error with drug administration, specifically suxamethonium instead of fentanyl, due to their vial's labeling resemblance. Indeed, an empty suxamethonium vial was found on the desk.



Discussion: Strategies like syringe labeling have decreased the incidence of healthcare-related errors. In emergencies, however, there is often no time to double check. In this case some determining factors were: the urgency of the situation, the labeling concealing (i.e. when charging the medication) and the omission of double-checking procedures.

Consequently, it is decided not to carry the succinylcholine vial along with other anesthesic drugs in order to avoid similar situations.

References:

1. Koyama AK, Maddox CS, Li L, et al. Effectiveness of double checking to reduce medication administration errors: a systematic reviewBMJ Quality & Safety 2020;29:595-603. 2. Institute of Medicine (US) Committee on Quality of Health Care in America. To Err is Human: Building a Safer Health System. Kohn LT, Corrigan JM, Donaldson MS, editors. Washington (DC): National Academies Press (US); 2000. PMID: 25077248.

Learning points: Errors related with medication administration are still very prevalent. These errors can reach the patient and can cause an adverse effect, especially in situations of vulnerability, such as in patients exposed to anesthesia.

52AP04-1

Learning from mistakes: an overview of injectable drug error practices in Portugal

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Background and Goal of Study: Drug labeling errors in anesthesia are estimated to occur in 1-1.25% of cases, with drug swaps accounting for 0.2%.1 The Association of Anaesthetists emphasizes that ensuring the safety of injectable drug preparation is both an individual and institutional responsibility. This survey aims to assess errors observed by anesthesiologists in Portugal and their handling.

Materials and Methods: A national survey was conducted among anesthesiology residents and specialists through the Portuguese Society of Anesthesiology. Participants were emailed a questionnaire asking about their experience with drug errors, types of errors observed, reporting practices, reasons for non-reporting, consequences, and changes made to prevent recurrence. Data were collected over November 2024.

Results and Discussion: From 732 anesthesiologists surveyed, 103 responded (14%). All respondents agreed on the importance of addressing drug errors. Of these, 15 had not witnessed errors, while 68 had observed at least two. Syringe swaps were the most common errors, followed by ampoule swaps and dosage errors. Of the respondents that witnessed errors, 63% reported that all errors were communicated, but formal notification occurred in only 13%. Reasons for non-reporting: undervaluation of errors (38%), the complexity (20%) or absence (19%) of reporting systems, and fear of blame (15%). Only 22 participants stated that all errors were discussed and reflected upon with the involved team, after notification.

While most reported errors had no clinical consequences, three led to cardiopulmonary arrest. Following errors, 88% reported implementing individual changes, such as enhanced daily systematization (48%), syringe preparation standardization (44%), and closed-loop communication (45%). Institutional changes were reported by 67%, including the introduction of color-coded labeling (49%), promotion of error reporting (47%), and the creation of "Look-Alike, Sound-Alike" and "Alert Medicines" lists (31%).

Conclusion(s): Standardized practices in preparing injectable drugs are essential to reduce errors. Encouraging effective error reporting and fostering team discussions can promote institutional learning and improve safety protocols. Overcoming reporting barriers and adopting preventive measures may be the key to enhancing patient safety in anesthesia.

References:

1. Anaesthesia: 78(10):1285-1294.

52AP04-2

Relationship between depth of neuromuscular block and retroglossal airway area: a prospective clinical investigation

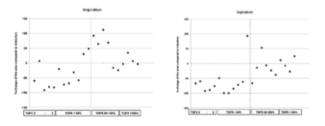
L. Asztalos¹, M. Boktor¹, M. Kukuly¹, D. Sólyom¹, A. Pongrácz¹, B. Fülesdi¹ ¹University of Debrecen, Department of Anesthesiology and Intensive Care, Debrecen, Hungary

Background and Goal of Study: We correlated the depth of neuromuscular block with changes in the retroglossal area induced by neuromuscular blocking agents (NMBAs).

Materials and Methods: The protocol was approved by local and national ethics committees and patients provided written informed consent. To compare the upper airway retroglossal areas before tracheal intubation and after extubation, 2 pharyngoscopic examinations were performed. The first was under propofol anaesthesia and spontaneous breathing using an Ambu® aScope™ (Ambu A/S, Denmark) placed nasally to visualize the vocal cords. Video images were recorded during inhalation and exhalation. Balanced anaesthesia included target-controlled propofol infusion and routine monitoring. A TetraGraph® (Senzime AB, Sweden) electromyograph recorded compound muscle action potentials (cMAPs) of adductor pollicis muscle. A second pharyngoscopy was performed immediately after tracheal extubation. A neuromuscular reversal agent was administered if quantitative post-extubation TOF ratio was <90%. Using the software Image J (Rasband WS, USA), the size of the airway was traced and the program calculated the area of interest.

Results and Discussion: Tracheal extubation based on traditional subjective means resulted in 12 of 21 (57%) patients being considered adequately recovered and received no antagonism. Seven (35%) of these patients had a TOF ratio below 90% at tracheal extubation.

Retroglossal areas in the TOF ratio ≤0.89 patient group (n=11) were lower (20-30% of baseline) both during inspiratory and expiratory phases compared to values measured after induction but before paralysis (baseline). In contrast, retroglossal areas in the TOF ratio ≥0.90 group (n=10) were only marginally lower (>80%) compared to induction values in both respiratory phases. (See Figure)



Conclusion(s): We recorded the retroglossal area at baseline and after administration of NMBA, allowing us to correlate change in glottic area as a function of depth of neuromuscular block. Our

data confirm that after neuromuscular block, a TOF ratio >0.90 is the minimal requirement for normalization of retroglossal area to prevent respiratory compromise.

52AP04-3

Improving safety in handover of surgical critical patients: Standard operating procedure and implementation of an admission checklist for the surgical ICU

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Background and Goal of Study: Care transitions, especially from the operating theatre to the surgical ICU, are a crucial patient safety issue, as improper handover can delay treatment and increase patient risk. Following an analysis of a patient safety event, this study aimed to improve safety during the handover of critical patients from the operating theatre to the surgical ICU.

Materials and Methods: A safety incident involved a nurse admitting a patient from the ICU who had an abdominal drain closed. Upon opening it, 800 ml of blood drained, leading to hypotension and tachycardia. The patient had undergone major digestive surgery with three abdominal drains, but no clear instructions on the drains' management were provided on admission or reviewed during staff shift changes. One drain had not been draining during the ICU admission, and after transfer to the ward, the nurse discovered it was closed. The team analysed the incident, identified contributory factors, and developed improvement measures, including:

- 1. A Standard Operating Procedure (SOP) for patient transfers from the operating theatre to the ICU.
- An admission checklist for the ICU, detailing the transition process and ensuring all critical patient information is communicated.
 A multidisciplinary meeting involving key surgical and ICU staff to review the case, improve safety culture, and teach the use of the new SOP and checklist.

Results and Discussion: An audit conducted a year after check-list implementation showed it was used in 72.5% of admissions, with full adherence in 70% of cases. The checklist usage was higher after planned surgeries (82%) compared to emergency surgeries (33%). The main challenge identified was incomplete teams during 72% of the admissions. Despite this, the audit revealed improvements in team satisfaction with the new transfer procedures.

Conclusion(s): Critical incident notifications can enhance patient safety during perioperative transitions. Checklists, tailored to the specific needs of each institution, improve safety and teamwork, helping prevent issues during patient transfers.

52AP04-4

Vasopressor support through peripheral access: A case of hypoperfusion injury resolution

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Background: Vasopressor support is typically administered through central venous catheters. However, in specific cases, peripheral venous access may be used when therapy is expected to be of short-term. This practice is common in operating rooms and intensive care units, where it has been shown to be safe. Adverse effects, such as tissue necrosis, are rare, particularly at lower doses (below 0,15 mcg/kg/min) and concentrations (less than 60 mca/ml) (1,2).

Case Report: We present a case of a 69-year-old male who underwent left hepatectomy and resection of a peritoneal lesion due to cholangiocarcinoma. His medical history included Crohn's disease and COPD. Anesthesia was induced with a combined intravenous and thoracic epidural technique. During the intraoperative period, specifically during the liver resection, noradrenaline infusion was required to maintain a mean arterial pressure (MAP) > 65 mmHg, with a maximum dose of 50 mcg/min. Postoperatively, hypoperfusion-related injury was identified in the upper limb, associated with pain. The vasopressor infusion was discontinued, and with close monitoring, the injury showed almost complete recovery within less than a month, without the need for surgical intervention.

Discussion: The use of noradrenaline via peripheral access is recommended, and the doses in accordance with the literature were strictly followed in this case. While rare, adverse effects like tissue necrosis can still occur, even at low doses, highlighting the importance of clear monitoring protocols. Noradrenaline was essential for blood pressure maintenance during liver resection, critical in major abdominal surgeries. Although rare, complications like hypoperfusion-related injury can occur, especially with prolonged or higher-dose use. In this case, the injury was selflimited and resolved with conservative management, emphasizing the need for continuous monitoring and early vasopressor cessation. The recovery without surgical intervention underscores the positive outcome with close follow-up.

References:

1) Yerke, J. R., et al. (2024). Peripheral Administration of Norepinephrine: A Prospective Observational Study. Elsevier, 355-384.

2)Stolz, A., et al. (2022). Safety and efficacy of peripheral versus centrally administered vasopressor infusion. Australian Critical Care, 506-511.

Learning points: Close monitoring is essential to identify and manage rare adverse effects, ensuring favorable outcomes.

52AP04-5

Preliminary results of the impact of GLP-1 analog use on gastric emptying following fasting prior to upper digestive endoscopy

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Background and Goal of Study: Glucagon-like peptide-1 (GLP-1) receptor agonists were initially approved for the treatment of type 2 diabetes mellitus, and their use has since been extended to promote weight loss. One of the main mechanisms of action is a delayed gastric emptying, which may result in an increase in gastric residual volume (GRV), even when patients adhere to fasting guidelines.

This study aimed to quantify GRV in obese patients undergoing upper gastrointestinal endoscopy, following the current fasting guidelines, and to determine whether the use of GLP-1 analogs increases the incidence of complications due to GRV.

Materials and Methods: This is a prospective, observational, single-center study with an estimated sample size of 200 patients. The inclusion criteria were obese patients with a body mass index (BMI) >30 kg/m², who were scheduled for gastroscopy.

Demographic and clinical data were collected, including GLP-1 analog treatment status, fasting hours for liquids and solids, observed gastric content (liquids and solids) using the Barcelona Scale, and any procedural incidents.

Results and Discussion: A total of 18 patients (mean age 58 ± 18 years, BMI 41 ± 7 kg/m2) were included in the preliminary analysis: 5 patients (27%) were receiving GLP-1 analogs, and 13 patients (73%) were not. No significant differences were observed between the two groups regarding age, BMI, ASA classification, fasting hours, or procedure time.

However, patients on GLP-1 analogs had a significantly higher rate of observed GRV (100% vs. 46%; p < 0.05). Despite this, no complications related to the elevated GRV were recorded.

	GLP-1 analogs	No GLP-1 analogs	p-value
	(n=5)	(n=13)	
Sex (Male / Female) n (%)	0(0) /5(100)	2(12) /11(78)	0.015
Age, years	43 ±12	46 ±19	NS
BMI, kg/m²	38±6	41±7	NS
ASA III, n (%)	4(80)	10 (77)	NS
Fasting hours performed:			
Solids, hours	13.4 ±3.7	18.1± 9.3	NS
Liquids, hours	4.4 ±3.3	8 ± 8.5	NS
Presence of RGV n (%)	5 (100)	6 (46)	0.048
Time (min) mean ±SD	18.4±18.8	16.5±11.5	NS

Data expressed as mean±SD and n (%)

Conclusion(s): Preliminary results suggest that the use of GLP-1 analogs in obese patients is associated with an increased rate of GRV, which could potentially raise the risk of complications during anesthesia, such as regurgitation and aspiration. These findings highlight the need to revise fasting guidelines for patients taking GLP-1 analogs to enhance safety and reduce the risk of aspiration.

52AP04-6

Complications following transesophageal echocardiography at a multicenter academic tertiary referral center

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Background and Goal of Study: Transesophageal Echocardiography (TEE) is a specialized form of cardiac ultrasound associated with rare but serious complications. Previous studies on complications related to TEE are outdated and focused on specific contexts, limiting the generalizability of their findings. Recent research suggests that TEE-related complications may be more common than previously recognized. As TEE becomes more widely used in clinical practice, there is a need to reassess its complications to ensure safe peri-procedural care.

Materials and Methods: A retrospective study of patients who underwent TEE between January 1, 2002, and March 1, 2022, was conducted at our large multicenter academic institution. Echocardiographic and medical records were manually reviewed for procedural complications. Post-procedural complications, consultation notes by gastroenterology, otolaryngology/ear, nose, throat, and/or thoracic surgery, and 30-day all-cause mortality were collected and manually reviewed.

True or potential TEE relat		lications	
distributio	n		
Complication		Overall	
Dysphagia within 24 hours		293 (12.5%)	
Dysphonia within 24 hours		244 (10.4%)	
Larynx or vocal cord injury			
Factors associated to TEE	OR	p value	
related complications			
Age	0.996	0.009	
Race	1.289	0.002	
Male	0.889	0.012	
BMI	0.985	<0.001	
Year of procedure	0.975	<0.001	
Intraoperative TEE cardioversion	0.571	<0.001	
TEE for catheter guidance	0.403	<0.001	
Steroid use within 90 days preop	1.129	0.035	
PPI use within 90 days preop	1.494	<0.01	
History of cerebrovascular	0.794	<0.001	
disease		2	
History of dysphagia	1.123	0.049	
History of esophageal surgery	1.412	<0.01	

Table 1. TEE related complications and associated factors.

Results and Discussion: 89,689 patients underwent 119,288 TEEs. Severe post-procedure complications directly attributable to TEE occurred in less than 0.5% of patients. Common complications included dysphagia (12.5%), dysphonia (10.4%), and larynx

or vocal cord injury (5.1%). The complication rate declined during the study period. Risk factors positively associated with periprocedural complications included age, BMI, gender, year of the procedure, type of TEE, steroids or PPI use within 90 days of procedure, and history of esophageal surgery (p<0.05). TEE-related complications were not significantly associated with an increased 30-day mortality.

Conclusion(s): This study is the largest to date evaluating TEE-related complications and provides more contemporary insights into peri-procedural complications. Serious complications were rare, though minor, self-limited effects occurred more commonly. Multiple risk factors were identified.

Of note, the rate of complications declined during the study period, possibly reflecting increased awareness, education, or procedural skill.

52AP04-8

Cardiac arrest during anesthesia induction for corneal transplantation in a Down syndrome patient

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Background: Down syndrome (DS) is associated with ocular conditions requiring surgery and intrinsic autonomic nervous system (ANS) dysfunction, ranging from transient bradycardia and hypotension to severe events such as cardiorespiratory arrest during anesthesia induction, as demonstrated in this case.

Case Report: A 70kg, 22-year-old woman with DS underwent corneal transplantation for keratoconus. Anticipating a difficult airway, diagnostic laryngoscopy was performed under sevoflurane with spontaneous ventilation, confirming a Cormack-Lehane grade 1 view. Induction was achieved with alfentanil (1.5 mg), propofol (30 mg), and succinylcholine (70 mg) for tracheal intubation

Shortly after induction, the patient developed severe hypotension, bradycardia, and asystole. Atropine and ephedrine were administered promptly, and cardiopulmonary resuscitation (CPR) restored spontaneous circulation after one cycle. The procedure proceeded without further complications, and the patient recovered fully in the ICU.

Discussion: DS patients often require general anesthesia for ophthalmic surgeries due to limited cooperation and potential airway challenges. However, DS-related ANS dysfunction complicates perioperative management. Heart rate variability (HRV), a proposed measure of autonomic stability, is not widely used in routine practice. In this case, autonomic imbalance likely contributed to cardiovascular collapse. Sevoflurane, combined with alfentanil, propofol and succinylcholine may have exacerbated parasympathetic dominance, leading to the event. The rapid recovery following CPR supports this hypothesis.

Anesthesiologists must be vigilant when managing DS patients, considering both anatomical and autonomic challenges. Tailored anesthetic strategies and heightened monitoring are critical to minimizing risks. The development of practical HRV tools could enhance risk stratification and guide perioperative management, reducing adverse outcomes in this population.

Learning Points: This case underscores the critical role of autonomic dysfunction in DS patients during anesthesia. Tools like HRV monitoring may improve risk assessment and guide tailored anesthetic plans. Meticulous preparation, vigilance, and awareness are essential to ensuring patient safety.

Reference:

Sinton JW, et al. Down syndrome and the autonomic nervous system: an educational review for the anesthesiologist. Paediatr Anaesth, 2022;32(5):609-616, doi:10.1111/pan.14416

52AP04-9

From chaos to checklist: creating a structured handover from anaesthetist to recovery staff

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Background and Goal of Study: Effective communication during patient handover between the anaesthetist and recovery staff is critical for patient safety, especially in managing postoperative care for vulnerable patients such as those with critical medications, as per RCoA guidelines [1].

The introduction of the WHO surgical safety checklist in 2009, promoted communication during surgery between team members and demonstrated a reduction in surgical mortality [2].

This study aimed to standardise the handover process between anaesthetists and recovery personnel and improve handover of critical information.

Materials and Methods: A service evaluation was registered with the local audit department and ethical approval was waived. A novel handover tool was created, modifying a universal handover tool used in the UK. In the first cycle, the handover of key parameters was assessed. The novel handover checklist was placed in each recovery bay and a re-audit of key parameters was completed.

Analysis compared pre and post intervention compliance rates across several categories using percentage change as a measure of improvement.

Results and Discussion: Post-intervention results showed significant improvements in several key areas. Compliance with handing over allergy status increased from 80% to 94%, whether antibiotics need to be continued from 53% to 94%, and reporting significant anaesthetic events from 23% to 100%.

Other improvements included need for postoperative fluids (+41%), target oxygen saturation (+65%), and requirement of special investigations (blood gas/haemacue/blood glucose) (+77%).

Despite these gains, 75% of cases still lacked a written postoperative care plan, highlighting an area for further improvement.

Conclusion: The introduction of a structured handover tool has led to marked improvements in communication between the anaesthetic and recovery staff and has led to enhanced patient safety.

However, challenges remain in ensuring written postoperative care plans. Future steps include expanding the handover format our satellite surgery site, re-auditing the tool to achieve 100% compliance in all areas.

References:

1. Royal College of Anaesthetists. Safe Handover: Guidance from the Working Party. 2020.

2. Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat A-HS, Dellinger EP, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. New England Journal of Medicine. 2009 Jan 29;360(5):491-9. doi:10.1056/ neimsa0810119.

52AP04-10

Risk factors for failure to rescue in major non-cardiac non-neurological surgery: analysis of 48,720 patients from the UK **Peri-operative Quality Improvement Programme** (PQIP)

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Background and Goal of Study: Failure to rescue (FTR) is defined as in-hospital death following a postoperative complication and is an important perioperative quality measure.

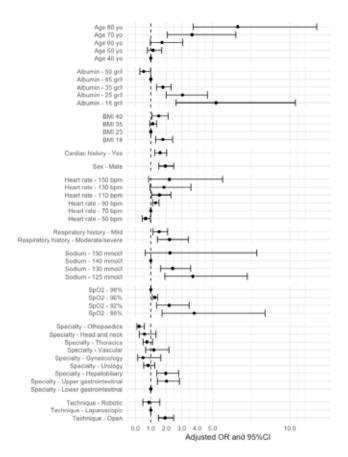
This study evaluated rates and risk factors for FTR in a large multicenter cohort from the UK's publicly funded national health service (NHS).

Materials and Methods: Data were analyzed from the UK Perioperative Quality Improvement Programme (PQIP), which includes prospective, patient-level data for adults undergoing elective major non-cardiac, non-neurological surgery in England and Wales. Postoperative complications were categorized using the Clavien-Dindo (CD) classification. FTR was defined as inpatient death following a postoperative complications of CD grade II or higher. Multivariate logistic regression was used to identify preoperative variables associated with FTR. Missing predictor data were addressed through multiple imputation. Ethical approval for PQIP was obtained from the UK Health Research Authority, and informed consent obtained from all participants.

Results and Discussion: Data from a total of 48.270 patients who underwent surgery in 173 hospitals between December 2016 and October 2023 were included in the analysis. Postoperative complications occurred in 23.8% of patients, with 360 in-hospital deaths (0.7%), resulting in an overall FTR rate of 3.1%. The median hospital stay was 6 days (interguartile range [IQR]: 3-9), increasing to 11 days (IQR: 7-18) among patients who developed complications.

Eleven variables were included in the final model (fig 1) and are presented as adjusted odds ratios (OR) with 95% confidence intervals (CI). These included fixed variables such as age and sex, body mass index, physiological variables, surgical factors and long-term conditions. A sensitivity analysis found no impact of the hospital site on FTR rates.

Conclusion(s): Postoperative complications are common, but FTR is uncommon after major non-cardiac surgery in the UK's NHS. Several preoperative factors were identified as being associated with FTR and could help identify higher risk patients, who could potentially benefit from enhanced postoperative monitoring and care.



52AP04-11 Glycaemia 99 mmol/I - case report

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Background: Diabetic ketoacidosis and a hyperosmolar state are the most serious and life-threatening emergencies in individuals with diabetes and can occur in individuals with both type 1 and 2 diabetes mellitus [1,2].

Case report: A 26-year-old noncompliant male with type I diabetes mellitus was admitted to the emergency department after resuscitation (ROSC 28 minutes). He had been intubated in the field; his blood glucose level was 99 mmol/l, and his osmolality was 358 mmol/kg. The first correction of his blood glucose level resulted in a decrease to 64 mmol/l, but the mistake was immediately recognized.

Within the next 2 days, his hyperglycaemia was corrected by an approximately 3 mmol/I decrease per hour, and post-ROSC care was performed. The patient's family was informed about the uncertain prognosis.

On the third day, divergence of the eyes was detected, and head CT was repeated with no pathology identified. EEG monitoring revealed nonconvulsive status epilepticus without a reaction to standard treatment, necessitating treatment with thiopentone coma. The patient developed septic shock and underwent tracheostomy. On the 17th day, the patient woke up, with no neurological injury: on the 22nd day, decannulation was performed. On the 32nd day, the patient was discharged home.

Discussion: In this report, we wanted to demonstrate the mistake of quickly correcting hyperglycaemia. A correction of 26 mmol/l per hour could result in cerebral oedema, which could easily harm the patient or even become fatal. The incident was investigated within the hospital, and a patient safety protocol was implement-

Negative incidents and mistakes are rarely reported in our hospital. Changes in hospital culture and a nonjudgmental and nonpunitive environment can help increase the incidence of reporting.

References:

- 1. Fayfman M, et al. Management of Hyperglycemic Crises: Diabetic Ketoacidosis and Hyperglycemic Hyperosmolar State. Med Clin North Am. 2017 May;101(3):587-606.
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- 3. Alkahf D, et al. . Exploring the safety reporting culture among healthcare practitioners in Saudi hospitals: a comprehensive 2022 national study. BMC Health Serv Res. 2024 Jun 28:24(1):769.

Learning points: Establishing an effective safety culture and incident reporting system is crucial for good patient outcomes. In the USA, medical errors are the third leading cause of death [3].

52AP04-12

Acute pulmonary edema secondary to operative hysteroscopic intravascular absorption syndrome and/or anaphylaxis in a latex-allergic woman: case report

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Background: Operative hysteroscopic intravascular absorption (OHIA) syndrome with an incidence of 0.1-6%, has fatal consequences. Monitoring the irrigation fluid balance is essential to rapidly detect signs of excessive fluid absorption.

We present the case of a patient who developed angioedema, initially oriented as anaphylaxis, and acute pulmonary edema (APE), which required admission to the ICU.

Case Report: A 43-year-old woman, allergic to latex, ASA 1, was scheduled for a hysteroscopic myomectomy. The procedure was carried out following a latex allergy protocol under sedation, maintaining spontaneous ventilation.

At minute 105, the patient presented desaturation, facial edema and chemosis. Anaphylaxis was suspected and appropriate treatment was administered. Orotracheal intubation was performed. Irrigation fluid balance was positive (+ 6L of 0.9% saline) and bilateral wet crackles were ausculted prompting the initiation of diuretic treatment and urine output monitoring.

Chest X-ray was consistent with APE. Bedside echocardiography revealed bilateral B-lines, no pleural effusion and good biventricular function. Arterial blood gas yielded mixed hyperchloremic acidosis. Patient was transferred to ICU, improved progressively and successfully extubated after 24 hours.

Discussion: OHIA is a rare complication with high morbimortality, preventable through proper management of key factors, such as irrigation fluid balance, which is crucial.

The initial diagnosis in this case was anaphylaxis, likely due to its more common recognition as an emergent situation. However, it underscores two key points: the need to consider OHIA syndrome, as well as the prioritization of patient stability over diagnosis in high-risk conditions.

References:

M.-T. Wang et al. Operative hysteroscopy intravascular absorption syndrome is more than just the gynecological transurethral resection of the prostate syndrome: A case series and literature review. Taiwanese Journal of Obstetrics & Gynecology (2020); 59 748-753.

Learning points: Proper management of fluid balance is crucial to prevent OHIA. The use of automated fluid management systems is recommended, and intravascular absorption should be limited based on the solution tonicity. It is essential to remain mindful that multiple severe events may coexist, each requiring immediate intervention.

Sustainability

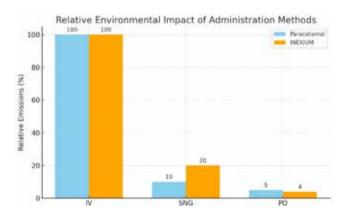
53AP01-1

Environmental impact of paracetamol and pantoprazole administration routes in intensive care: intravenous vs. enteral

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Background and Goal of Study: The healthcare sector is a significant contributor to greenhouse gas (GHG) emissions and environmental pollution. Medication use, particularly in decarbonized energy settings, constitutes a substantial portion of the healthcare sector's carbon footprint (1-2).

This study evaluates the environmental impacts of intravenous (IV), nasogastric (SNG), and per os (PO) administration of paracetamol and pantoprazole in intensive care units.



Materials and Methods: A Life Cycle Assessment (LCA) was conducted to compare the environmental impacts of administering standard doses of paracetamol (1000 mg) and pantoprazole (40 mg) through IV, SNG, and PO routes. Key outcomes included carbon footprint (kg CO₂ eq), toxicity (environmental and human), resource use, and water consumption. The analysis followed ISO 14044 guidelines and used the ReCiPe 2016 Midpoint (H) methodology.

Results and Discussion: The environmental impact of IV administration was significantly higher than enteral methods across all indicators. For paracetamol, the carbon footprint of IV administration was 10 times greater than SNG and 20 times higher than PO. For pantoprazole, IV administration resulted in 5 times the emissions of SNG and 25 times that of PO. PO administration consistently showed the lowest environmental impact. These findings are illustrated in the graph below, highlighting the relative emissions of the three routes.

Conclusion(s): Transitioning from IV to enteral administration, particularly PO, can substantially reduce the environmental footprint of intensive care practices. These findings support the systematic prioritization of enteral routes when clinically appropriate, aligning patient care with sustainability goals.

References:

1. Davies JF, McAlister S, Eckelman MJ, et al. Environmental and financial impacts of perioperative paracetamol use: a multicentre international life-cycle analysis. Br J Anaesth. 2024; doi: 10.1016/j.bja.2023.11.053.

2. Hunfeld N, Tibboel D, Gommers D. The paracetamol challenge in intensive care: going green with paracetamol. Intensive Care Med. 2024 Dec;50(12):2182-2184.

53AP01-2

The environmental impact of coronary artery bypass grafting surgery and postoperative intensive care unit admission: a state-of-the-science life cycle assessment

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Background: Healthcare faces an urgent challenge to reduce its negative environmental impact to contribute to the mitigation of human-induced environmental change. The operating room (OR) and intensive care unit (ICU) are known to be resource-intensive, yet understanding regarding the key focus areas for impact mitigation in individual patient trajectories is still limited. Therefore, we chose to focus on a common major surgery requiring postoperative ICU-admission: coronary artery bypass grafting (CABG). Goal of Study: To identify key areas for environmental impact mitigation.

Materials and Methods: We performed a state-of-the-science life cycle assessment following international ISO-14040/44 standards to quantify the environmental impacts per patient, from OR-admission to ICU-discharge. We investigated all products, processes, and services required for care delivery based on a sample of 12 patients in a Dutch academic hospital. Environmental impacts were quantified from cradle to grave using ReCiPe 2016 (H) methodology and studied using contribution, uncertainty, and sensitivity analysis. We reported medians and interquartile

Results and Discussion: A single patient trajectory primarily contributed to global warming, amounting to 314 [296-333] kgCO₂eq for the OR and 77 [68-93] kgCO₂eq for the ICU. Further notable environmental impacts were fine particulate matter, (non-) carcinogenic toxicity, land use, and terrestrial acidification. Highquality plastic disposables, energy use related to air handling, and employee commute contributed most of the OR's environmental impact. Anaesthesia's impact was relatively low due to predominant use of total intravenous anaesthesia - compared to use of inhalational anaesthesia, which are potent greenhouse gases. Key areas for environmental impact in the ICU are indicated in Figure 1.

Conclusion: Most impact mitigation could be achieved by avoiding/reducing disposable product use, optimising OR air handling systems, switching to renewable energy, and encouraging lowemission employee commute.

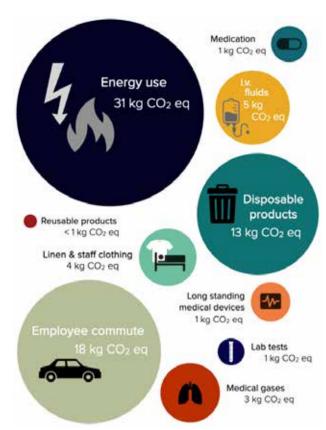


Figure 1. Overview of the carbon footprint of a CABG postoperative ICU-admission

53AP01-3 Climate impact of BIS sensor

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Background and Goal of Study: Environmental concerns, especially with sevoflurane, support using Total Intravenous Anesthesia (TIVA) over inhalation methods¹. Volatile anesthetics allow for continuous monitoring of end-tidal concentrations, providing a reliable indication of anesthetic depth. TIVA, on the other hand, lacks an equivalent to end-tidal values, which can increase the risk of inadequate anesthesia depth due to various factors².

Target-Controlled Infusion (TCI) helps but doesn't fully address this. Guidelines recommend Bispectral Index (BIS) monitoring for real-time depth feedback. Despite TIVA's lower environmental impact, BIS's single-use electrodes raise concerns, requiring a comparison with sevoflurane's carbon footprint.

Materials and Methods: We calculated that the production and disposal of a single BIS electrode (from a box of 25 electrodes) emit approximately 79 grams of CO₂ equivalent emissions (CO₂EE) (Table 1).3

Results and Discussion: In contrast, even in minimal-flow settings, sevoflurane releases approximately 13 kilograms of CO2 equivalent emissions (CO₂EE) per hour, whereas TIVA anesthesia produces at most 1 kilogram of CO₂EE per hour.¹ The environmental impact of a BIS electrode is therefore minimal compared to sevoflurane, underscoring the environmental benefits of TIVA with BIS monitoring.

	weight (gr)	gr CO ₂ E			
	weight (gr)	production	incineration	total	
Pouch (laminated paper)	9,29	8,54	16,72	25,26	
release liner (LDPE)	3,59	9,29	11,28	20,57	
BIS sensor (mixed plastic)	3,42	10,61	10,75	21,36	
cardboard box (1/25)	3,70	2,97	6,67	9,63	
paper leaflet (1/25)	0,77	0,70	1,39	2,09	
sum	20,77	32,10	46,80	78,91	

Table 1: CO₂ equivalent emissions of a single BIS electrode

Conclusion(s): While sevoflurane offers simplicity in titration, its substantial environmental footprint remains a concern. TIVA with BIS monitoring not only addresses ecological considerations but also enhances clinical outcomes by ensuring precise anaesthesia

These findings underscore that ecological responsibility can be harmoniously aligned with clinical efficacy and patient safety in anaesthesia decision-making. Over a 20-year time horizon, only 1 ml sevoflurane has cradle-to-grave CO2EE of 2294 grams, which is as much as the CO2EE of 29 BIS sensors.

References:

- 1. Kalmar AF, Teunkens A, Rex S. Eur J Anaesthesiol 2024; 41: 465-467.
- 2. Nimmo et al. Anaesthesia 2019; 74: 211-224.
- 3. https://www.gov.uk/government/publications/greenhousegas-reporting-conversion-factors-2023

53AP01-4

The impact of postoperative fasting on the length of hospital stay and healthcare sustainability: a meta-analysis

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Background and Goal of Study: International guidelines on the resumption of postoperative intake of liquids and solids remain scarce. Surgical patients are subjected to unnecessarily prolonged postoperative fasting times, resulting in increased postoperative morbidity. Reduced length of postoperative fasting has been shown to enhance postoperative recovery, improve rehabilitation, and alleviate the psychological burden of major surgery in such patients.

These benefits may result in decreased length of hospital stay. which in turn may benefit healthcare sustainability. Given these potential benefits, this meta-analysis aimed to quantitatively explore the relationship between the duration of postoperative fasting duration and length of hospital stay.

Materials and Methods: This is a meta-analysis, carried out as an adjunct of a literature review of clinical evidence by the ESAIC Task Force on Perioperative Fasting in Adults.

A systematic literature search was conducted between 1st January 2010 to 6th January 2023. Bibliographic databases were used, including MEDLINE (OVID), Enbase (OVID), CINAHL, Web of Science, the Cochrane Database of Systematic Reviews (CDSR) and the Cochrane Central Register of Controlled Trials (CENTRAL). Eligible manuscripts were original studies published in English between 1st January 2010 and 6th January 2023.

Results and Discussion: The results indicated a significant decrease in the length of hospital stay in all the stages of data analysis (p < 0.05). A mean difference of 0.9 days for patients with earlier postoperative intake of liquids (p < 0.05).

Conclusion(s): Shorter postoperative fasting times reduce the length of hospital stay, resulting in improved patient outcomes and enhanced healthcare sustainability.

53AP01-5 ECO-BQ Project: introduction to waste segregation in the surgical environment

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Background and Goal of Study: The growing concern about the environmental impact of our activities has led to an increasing number of studies highlighting the importance of recycling in the surgical field. For this reason, an initiative to introduce waste segregation was launched at our center in 2020.

Hypothesis: The implementation of a waste segregation program in total knee prosthesis surgeries reduces the amount of health-care waste.

Objectives:

- To assess the amount of healthcare waste generated in total knee prosthesis surgeries before and after implementing segregation measures.
- To evaluate the proportion of recycled plastic and paper/cardboard in total knee prosthesis surgeries.

Materials and Methods: This study is a non-randomized, non-double-blind controlled clinical trial involving 20 cases of non-infectious total knee prosthesis replacements collected between October 2022 and March 2023.

Initially, non-hazardous healthcare waste (Groups I and II, general waste) and hazardous healthcare waste (Groups III and IV, sharps and biosanitary) generated per surgical procedure were measured by weight (kg) and volume (L). The same variables were then measured after segregating non-hazardous waste into paper/cardboard and plastic.

The primary variables were the weight and volume of healthcare waste generated during each procedure. Data collection was conducted using a data collection sheet, followed by the creation of a database for subsequent descriptive analysis using the Student's t-test.

	NO	CEODEOATION
	NO segregation (n=10)	SEGREGATION (n=10)
Total number of bags	7 (4-7)	6 (5-8)
Total number of general waste bags	5 (4-7)	2 (1-3)
Weight of general waste (kg)	11 (9.77-20)	5.19 (1.58-6.48)
Weight of paper (kg)	0	3.16 (2.42-3.70)
Weight of plastic (kg)	0	2.44 (1.50-3.40)

Results and Discussion: The median of the obtained results is presented. The duration of the surgeries was similar in both groups (110–120 minutes), as was the weight of sharps waste (0.02 kg).

Conclusion(s): Waste segregation in the surgical setting is an effective measure, as it reduces the amount of non-recyclable waste by more than half. Non-biosanitary paper and plastic constitute the main categories where this action can be implemented.

53AP01-6

Turning down the fans: how to save money and reduce CO₂ emissions in operating theatres

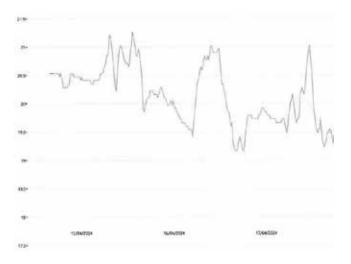
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Background and Goal of Study: Operating theatres' ventilation require a minimum of 22 air changes per hour when in use¹. Most modern theatres, including at our hospital, have a set back function which is a control strategy that reduces air velocity to a minimum standard, well below the operationally required changes per hour. This set back function has not been utilised at our hospital since the COVID pandemic due to rule changes which have since been revoked. Concerns had been raised that using this set back function again would reduce theatre temperatures below that necessary of 18°C¹.

Our goal was to show that setting the ventilation back overnight did not significantly impact theatre temperature and that by implementing it, both environmental and financial gains could be made.

Materials and Methods: Over two consecutive nights a randomly chosen operating theatre's ventilation was set back between the hours of 23.00 and 08.00 and automatic temperature logs were analysed. Estimates of the reduction in tonnes of CO₂ equivalents [tCO₂e] and cost savings were calculated using the known 70% reduction in fan power during set back and the institution's power tariff.

Results and Discussion: Operating theatre temperature never fell below 19°C as shown in the graph.



A conservative estimate of $12.24 \text{tCO}_2\text{e}$ per annum were saved. The energy savings were estimated at 59,136kWh per annum giving a cost saving of £14,606 per annum.

This does not take into account savings achieved from reduced ventilation maintenance, longer filter life and increased longevity of the air handling unit all resulting from setting back of the ventilation system.

These calculations involved our hospital's 8 main operating theatres. There are a further 11 theatres across our trust which were not included in this study but could also be set back.

Conclusion(s): Utilising a ventilation set back system out of hours does allow safe operating temperatures to remain and has significant environmental and cost saving benefits.

References:

1NHS England (2021) Health Technical Memorandum 03-01 Specialised ventilation for healthcare premises. PAR38. London, NHS England and NHS Improvement.

53AP01-7

Towards a more sustainable operating theater: perspectives of Belgian surgeons, anesthesiologists, nurses, and other operating theater professionals

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Background and Goal of Study: Hospitals generate significant amounts of waste, with operating rooms (ORs) being major contributors to pollution and carbon emissions. This study investigated the willingness and barriers of OR professionals in Belgium to act more sustainably, focusing on waste segregation and recycling within ORs.

Materials and Methods: We conducted a cross-sectional study using an online questionnaire targeting professionals in Belgian ORs, including anesthesiologists, surgeons, nurses, and other operating theater staff. The questionnaire was distributed in three languages (Dutch, French, and English) and included closed questions using Likert scales and multiple-choice questions. Statistical analysis was performed using Pearson's chi-squared and Fisher's exact tests for group comparisons.

Results and Discussion: Of the 673 participants, nurses formed the largest group. More than 60% had extensive experience (>10 years in OR). The vast majority segregated waste at home, but much less waste was segregated in ORs, despite high willingness. Unlike other waste categories, hazardous medical waste is universally segregated. Papers and plastics are often treated as nonhazardous waste.

The main perceived barriers are proper waste facilities and time and space constraints, indicating that effective implementation is hampered by structural deficiencies.

A sub-study showed most anesthesiologists used sevoflurane with low or very low fresh gas flow, contributing to lower CO2 emissions. Potent greenhouse gases like N2O and desflurane are infrequently used.

Conclusion(s): The study shows a gap between Belgian OR professionals' willingness to act sustainably and their actual implementation. Improving infrastructure and providing training and information are essential steps in promoting sustainable waste management within hospitals. These changes can lead to a more sustainable health care environment.



Figure.

Reference:

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53AP01-8

Safety of preanesthetic assessment by teleconsultation in digestive endoscopy procedures for patients ≤ 65 years: prospective qualitative study

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Background and Goal of Study: The transition to remote preanesthetic consultations was accelerated by the COVID-19 pandemic, raising questions about its safety. The department of Anesthesiology. Intensive Care. Perioperative Medicine, and Algology at Brussels' University Hospital - Erasmus adopted telephone consultations for young, healthy patients scheduled for minor procedures.

This study was conducted in the hospital's One-Day Clinic and aimed to evaluate the safety of this consultation method for gastrointestinal tract endoscopies. Additional assessed aspects included patient satisfaction, compliance with the Belgian Health Care Knowledge Centre (KCE) guidelines for preoperative exams, time spent on consultations, and the carbon footprint.

Materials and Methods: This study primarily aimed to evaluate the safety of the recently implemented preanesthetic teleconsultation compared to the in-person consultation conducted until 2023. A risk assessment questionnaire completed by the anesthesiologist was used for this purpose. Patient satisfaction was assessed through questionnaires based on the Likert scale, and the alignment of prescribed preoperative tests with the KCE guidelines was also evaluated.

Furthermore, the total time dedicated to the consultation and the associated carbon footprint were analyzed. The carbon footprint was calculated by multiplying the distance between the patients' residential addresses and the hospital by a ratio of 104.6 gCO₂/km, as established by the European Environment Agency (EEA).

Results and Discussion: Teleconsultation appears to be safe. Both groups expressed satisfaction with their consultation approach. However, patients who underwent a traditional in-person consultation were less receptive to teleconsultation (p = 0.001). Compliance with the KCE guidelines was higher in the teleconsultation group. Patients who attended in person spent more time on their consultation and generated a higher carbon footprint.

Conclusion(s): Teleconsultation is a safe method for pre-anesthetic evaluation in scheduled endoscopies at the One-Day Clinic of Erasmus Hospital. It ensures patient satisfaction, reduces unnecessary preoperative tests, and optimizes both time and the carbon footprint.

Acknowledgements: Professor Céline Boudart, Professor Turgay Tuna and the entire team of the One-Day Clinic at Brussels' University Hospital - Erasmus are gratefully acknowledged for their invaluable contributions to the success of this study.

53AP01-9 Sustainability in operating rooms

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Background and Goal of Study: The biggest global health threat of the century arises from the accumulation of 'greenhouse' gases. H The healthcare sector is one of the biggest contributors of greenhouse gas emissions, with the NHS accounting for 4.6% of the UK's total carbon footprint. Operating theatres have a disproportionate environmental impact because of energy-intensive processes, consumption of resources, use of volatile anaesthetics and production of waste. They tend to produce approximately 50–70% of the total hospital waste. The NHS, supported by the UKHACC has pledged to meet a 'Net Zero' carbon target by 2040 through its Greener NHS campaign. Incorrect sorting of waste is often caused by a lack of understanding of the nuances of waste segregation, compounded by complex colour coding, lack of leadership and improper planning.

Materials and Methods: Our aim was to find out the knowledge, attitude and practice of theatre staffs (35 participants) on waste segregation at Luton & Dunstable Hospital. We surveyed surgeons (6%), anaesthetists (31%), ODP (29%) scrub team (29%) and recovery nurses (6%) using a questionnaire in person. Further, they were asked about the benefits of waste segregation and times when they would dispose wastes correctly and reasons for not doing.

Questions on cost of disposal of different type of wastes were also included and general opinion on waste disposal was collected. We inspected 17 theatres to see if green bags were used appropriately.

Results and Discussion: : 51% would dispose wastes appropriately every time vs 49% at most of the times. The reasons for inappropriate disposal were unavailability of bags (25.7%), inattention and more training (25.7%). 34.2% had no idea about the cost for disposal. 49% thought waste disposal is vital because of environmental impact, cost (27%), ease of recycling (11%) and infection risks (13%). Staffs with no idea of type of wastes going

into yellow, orange, green and clear bags were 9%,30%,17%,18% respectively. 67% staffs insisted on more training sessions and knowledge gap was highlighted.

Conclusion(s):): To educate staff on waste segregation and increase the availability of general waste bins. To use product coding to enable more accurate and efficient sorting of waste, more training sessions and workshops at regular intervals. Information about economics of waste disposal will improve compliance.

53AP01-10

Segregation of healthcare waste in the intensive care unit: a single-centre pilot study

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Background and Goal of Study: Singapore's healthcare sector contributes 3.4% of total carbon emissions, ranking Singapore as second globally in healthcare per capita emissions. Locally, medical waste has increased over the past 5 years from 4400 tonnes to 5700 tonnes. However, recycling opportunities are often missed due to many perceived barriers. In our hospital, waste was previously only separated into biohazard, sharps and general wastes with no segregation for recyclables. We aimed to increase staff awareness and uptake of plastic waste segregation to facilitate recycling in Tan Tock Seng Hospital.

Materials and Methods: We conducted a 2-phase pilot study in 1 intensive care unit in a hospital in Singapore for the segregation and recycling of plastic wastes in collaboration with a recycling company. In phase I, we conducted a 1-day trial in a 16-bed ICU whereby a recycling bin was set up for segregating plastic waste. Nursing staff were educated on the types of plastics to be recycled according to the plastic resin identification codes, and the recycled waste was weighed. The data was used to design the second phase. In phase II, we conducted a 6-week trial in the same ICU whereby nursing staff were instructed to segregate specific plastic items into a recycling bin for which these bins were weighed daily. In both phases of the study, staff were given a questionnaire to fill in during the study period.

Results and Discussion: In phase I, the amount of plastic waste generated per patient per day was 0.35kg. 88.2% of nursing staff expressed interest in recycling and 61.7% were likely to actively segregate ICU waste.

Some barriers included perceived infectious risks, decreased work efficiency and lack of recycling infrastructure. In phase II, nurses were asked to segregate 3 specific plastic items – apron covers, water irrigation bottle and bottle caps. An average of 49.6kg of plastic waste was segregated per week, averaging 0.44kg of plastic waste per patient per day.

More than 68% of respondents were able to accurately detail the appropriate process for recycling these items. They also suggested including a greater variety of recyclable paper and metal wastes.

Conclusion(s): Our pilot study highlights the active interest in and feasibility of recycling healthcare waste. Ongoing efforts with our infectious disease department have highlighted more possibilities for recycling more healthcare waste. Recycling efforts can further be extended hospital wide.

Education

54AP01-1

A national advanced airway management course for moldovan anaesthesiology residents: initial results

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Background and Goal of Study: Airway skills training and immersive simulation sessions incorporating social and cognitive (nontechnical) aptitudes have been long recognised as contributing to more effective and safer airway management [1], especially when training is backed up by the Difficult Airway Society (DAS) guidelines [2]. Our goal was to implement a mandatory National Advanced

Airway Management Course in the Moldovan anaesthesiology training (NAAM-M).

Materials and Methods: Under the leadership of the European Society of Anaesthesiology and Intensive Care and Society for Simulation in Europe, and with support from the Romanian and Moldovan

Societies in Anaesthesia and Intensive Care, a national pool of Moldovan instructors underwent a NAAM-M Train the Trainer course in March 2024. During June - September

2024, NAAM-M was rolled out to a cohort of Moldovan anaesthesiology residents. The course lasts 2 days, and the content was a combination of theory, stations skills,

and immersive simulation scenarios followed by debrief. The participants were asked to complete an online pre-and post-course MCQ test and an anonymous post course feedback form.

Results and Discussion: A total of forty-five 3 rd and 4 th year anaesthesiology residents took part in 2 courses. All participants completed the online MCQ and feedback form. The mean preand post-MCQ

scores were 50.4% and 94.0%. Most participants highly rated the course, mean score 4.81/5 (SD 0.66). Majority of participants found the course informative and reported new learning, mean score 4.67/5 (SD 0.78).

Participants reported significant learning in managing difficult airways and applying DAS protocols. The course appeared to improve participants' confidence and competence in handling emergency airway management. The course was considered relevant to participants' professional activities, mean score 4.84/5 (SD 0.65).

Most participants reported an 'adequate' balance between practical and theoretical activities. Participants appreciated the interactive nature of the course, like engaging clinical scenarios, simulation and hands-on skill stations.

Conclusion(s): Data suggests that NAAM-M has led to improvement in the knowledge, practical abilities and confidence in this small cohort of anaesthesiology residents. The authors find this reassuring and an initial step forward towards the implementation of advanced airway teaching methods and technologies in the Moldovan anaesthesiology training.

54AP01-2

Emergency Front of Neck Access (eFONA): a comparison of performance of consultants and non-consultants in simulated 'can't intubate. can't oxygenate' (CICO) scenarios

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Background and Goal of Study: Emergency Front of Neck Access (eFONA) technique is a vital part of training for clinicians involved in airway management as it forms the final life-saving step in the management of 'Can't Intubate, Can't Oxygenate' (CICO) scenarios to prevent hypoxaemic complications, forming Plan D in the Difficult Airways Society (DAS) guidelines1.

Our objective was to study the proficiency of clinicians in their management of simulated CICO scenarios using eFONA, comparing Consultant Clinicians (CCs) vs Non-Consultant Clinicians (NCCs).

Materials and Methods: We assessed the proficiency of 5 CCs (from anaesthesia) vs 10 NCCs (from anaesthesia, intensive care and emergency medicine) at Newham University Hospital in managing simulated CICO scenarios using scalpel cricothyroidotomy (scalpel-bougie-tube) technique. Data was gathered using scores to assess proficiency and time to completion. Mean values were compared using confidence intervals (CIs). All 5 of the CCs and 4 of the NCCs underwent CICO training over 12 months prior to assessment, 4 NCCs 6-12 months prior and 2 NCCs within the last 6 months. Clinicians had 2 attempts at the CICO scenario, receiving no prompts prior to attempt 1 (A1), then receiving guidelines before attempt 2 (A2). Individual points were given for completing a step of the eFONA algorithm, formed by modified DAS guidelines to produce a 14-step process.

Results and Discussion: NCCs scored higher than CCs in A1 (mean scores 9±2.02 vs 7±1.07). All clinicians showed a significant improvement in mean scores in A1 (8.33±1.45) vs A2 (12.73±0.59). Completion times (seconds) were lower in CCs (134.4±34.63 in A1; 102±29.25 in A2) than in NCCs (161.4±37.46 in A1; 114.3±34.76 in A2). Results are expressed with 95% Cl.

Conclusions: Trends show higher scores in A1 in NCCs, and faster completion in CCs, however these data lack statistical significance. Given the more recent CICO training in NCCs, and statistically significant score improvement of all clinicians after prompting, further research with larger sample sizes are required to analyse the correlation between training frequency and eFO-NA performance.

References:

1. Price, T.M; McCoy, E.P. Emergency Front of Neck Access in Airway Management, British Journal of Anaesthesia [Internet]. 2019 June 14 [cited date - 2024 Nov 13]; 19(8): 246-253. Available from: https://www.bjaed.org/action/sho wPdf?pii=S2058-5349%2819%2930066-6. DOI: 10.1016/j. bjae.2019.04.002

Development of a workplace-based assessment scale for nurse anesthetist students

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Background and Goal of Study: Assessing clinical competence is vital in nurse anesthesia education to ensure the development of safe and proficient practitioners¹. The increasing complexity of healthcare underscores the need for reliable and valid instruments to evaluate nurse anesthetist students' performance in workplace settings. A standardized workplace-based assessment (WBA) scale is essential for accurately measuring clinical and professional competencies in real-world practice environments².

This study aimed to develop and validate a skill assessment tool for evaluating the workplace performance of nurse anesthesia students through psychometric analysis of its reliability and validity.

Materials and Methods: The study was conducted in three sequential phases:

Scale Development: A comprehensive literature review and expert consultations were undertaken to construct the initial assessment items.

Content Validation: The draft scale was reviewed by three expert anesthetists for content validity.

Psychometric Testing: The final scale was evaluated using data from 40 nurse anesthetist student assessments.

Results and Discussion: The finalized WBA scale consisted of 24 items spanning three key domains: Patient and equipment preparation, technical skills and Non-technical skills.

Psychometric analysis demonstrated strong internal consistency (Cronbach's α = 0.93), high inter-rater reliability (ICC = 0.87), and moderate concurrent validity as evidenced by Pearson's correlation analysis. These findings affirm the scale's robustness in reliably assessing clinical performance.

Conclusion(s): The newly developed workplace-based assessment scale exhibits strong psychometric properties, providing a reliable and comprehensive tool for evaluating the clinical competencies of nurse anesthetist students in practice settings.

References:

- 1. Sanclemente-Dalmau M, Galbany-Estragués P, Palomar-Aumatell X, Rubinat-Arnaldo E. Defining competencies for nurse anaesthetists: a Delphi study. J Advanced Nursing. 2022 Nov;78(11):3696-709.
- 2. Singh T, Norcini JJ. Workplace-based assessment. In International best practices for evaluation in the health professions 2022 Feb 16 (pp. 257-279). CRC Press.

54AP01-5 Zooming down: incentivizing a return to in-person grand rounds

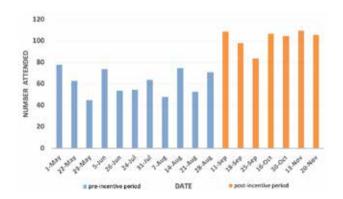
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Background and Goal of Study: When the worldwide COVID-19 pandemic led to lockdowns and travel restrictions, grand round lectures were transitioned to a virtual format. This change, while necessary, led to diminished engagement and attendance. In January 2023, our department resumed in-person grand rounds, yet attendance remained lower than pre-pandemic levels.

Recognizing the importance of these educational opportunities, departmental leadership sought strategies to improve in-person participation through the introduction of a targeted incentive program.

Materials and Methods: In September 2024, an incentive structure was implemented linking grand rounds attendance to a portion of a faculty incentive award. Specifically, in-person attendance was set to account for 5% of the incentive award amount. Faculty were expected to attend ≥ 80% of all grand rounds unless they were serving in an excused role. We compared attendance rates over the three months following the incentive's implementation to the four-month period preceding it.

Results and Discussion: The attendance for grand rounds during the study period is shown in Figure 1. Eleven of the grand rounds occurred in the pre-incentive period, with 7 occurring after incentive implementation. The attendance in the post-incentive period (102.7 \pm 9.1) was statistically greater than the pre-incentive period (61.8 \pm 11.6; p < 0.0001). The minimum attendance in the post incentive era (range: 45,78) was greater than the maximum attendance in the pre-incentive period (range: 84,110). Overall, attendance in the post-incentive period improved by 66% compared to the pre-incentive period.



Conclusion(s): The results of this study suggest that well-designed incentive programs can play a significant role in achieving departmental goals, such as enhancing educational experiences and fostering professional development. Encouraging in-person attendance through incentives may be a viable strategy for other departments facing similar challenges in the post-COVID era.

Reference:

1. Adashi EY. The Demise of In-Person Grand Rounds: The Triumph of Virtuality. Am J Med. 2024 Dec:137(12):1157-1158.

Online regional anesthesia resources - are they effective? Comparison between self-directed online educational material and conventional teaching in acquiring ultrasound-guided regional anesthesia skills for supraclavicular brachial plexus block by novice performers

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Background and Goal of Study: Ultrasound is an important innovation in regional anesthesia (RA). The proper performance of ultrasound guided RA (UGRA) is a useful competency for any anesthesiologist. However, there are some obstacles to RA education. The increasing availability of UGRA-related online resources may have a value for trainees. The objective of this study is to assess the impact of using educational material from The New York School of Regional Anesthesia (NYSORA) and Ultrasound for Regional Anesthesia (USRA) websites on the learning process of novice trainees on ultrasound guided supraclavicular brachial plexus block (SBPB).

Materials and Methods: Randomized controlled trial comparing directed independent learning using NYSORA and USRA online educational material versus conventional in-person teaching, in acquiring UGRA skills for SBPB, among first year anesthesiology residents (PGY1s). The primary outcome was the performance when demonstrating ultrasound images for SBPB on live model, in a task specific checklist: the Sonographic Proficiency Assessment Score (SPAS).

Results and Discussion: Twenty-three PGY1s were enrolled. SPAS was statistically higher for the Online group [30.0 (26.0-31.0)] than for the In-person group [25.0 (22.0-26.0)], p=0.009.

	In-person group (n = 11)	Online group (n = 12)	P value
Gender			0.292ª
Female, n (%)	4 (36.36)	7 (58.33)	
Male, n (%)	7 (63.64)	5 (41.67)	
SPAS, median (IQR)	25.0 (22.0 – 26.0)	30.0 (26.0 – 31.0)	0.009 b
Quality of best acquired image			0.59 °
0 – completely inaccurate image, n (%)	1 (9.09)	0 (0.00)	
1 – poor quality, n (%)	0 (0.00)	1 (8.33)	
2 – moderate quality, n (%)	0 (0.00)	2 (16.67)	
3 – good quality, n (%)	8 (72.73)	8 (66.67)	
4 – excellent quality, n (%)	2 (18.18)	1 (8.33)	

SPAS: Sonographic Proficiency Assessment Score; IQR: interquartile range. a: Chi-square test. b: Wilcoxon rank sum test. c: Fisher exact test

Table 1. Comparison of participants` characteristics and outcomes between groups.

Conclusion(s): Online available educational material from NYSO-RA and USRA performed better for SBPB image acquisition and sonoanatomy interpretation learning skills, among PGY1s.

Reference:

Tewfik GL et al. Objective validation of YouTube™ educational videos for the instruction of regional anesthesia nerve blocks: a novel approach. BMC Anesthesiol. 2020 Jul 9;20(1):168.

54AP01-7

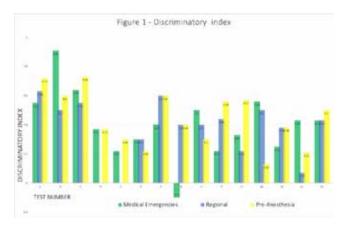
Simulated exam modules as a tool for summative evaluation of anesthesia residency graduates

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Background and Goal of Study: Oral boards entailing questions and discussion have traditionally been conducted for anesthesia residency graduation. Recently, testing methods evolved to include simulated components. The Israeli oral board examinations employ three types of simulated modules: simulated medical emergencies (SME), ultrasound based regional anesthesia stations (RA), and pre-anesthetic clinic visits (PAV). We examined the ability of simulated modules to predict the candidates' passing odds.

Materials and Methods: We reviewed results from 15 consecutive exams starting July 2020 onward. A total of 43 different stations were examined, including 15 SME, 15 PAV, and 13 RA. In addition to simulated stations, each exam had 4-5 "traditional" oral encounters. The weight of each station (oral and simulated) in the calculation of the final score was equal. We used Discriminatory index, based on the portion of high score candidates passing the station in comparison to low score candidates.

Results and Discussion: Records from 471 SME and PAV encounters, and 386 RA encounters were tested. Simulated stations showed a good (over 60%) predictive and negative value for exam passing and failing odds, respectively. Discriminatory index was almost always positive with an average of 0.4 for SME, 0.44 for PAV and 0.42 for RA (Figure 1).



Conclusion(s): Theoretical oral exams may not be sensitive enough to assess all crucial skills. We demonstrate that simulated exam modules are effective in distinguishing high scoring candidates from low scoring ones. Thus, simulated exams allow testing more than theoretical knowledge without losing data related to theoretical knowledge. However, more studies comparing theoretical and simulated exams are needed.

An evaluation of the Microsoft HoloLens2 in the clinical teaching of pain pathways for undergraduate medical students

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Background: In medical education, vertical integration refers to integration between the clinical and basic sciences. Mixed reality (MR) is a rendered experience in which virtual and "real" elements are perceived simultaneously. The Microsoft HoloLens2 (HL2) is a novel MR headset which can facilitate a live two-way broadcast to (a)remote environment(s). We present a mixed methods study which examines the feasibility, usability and efficacy of MR in the education of medical students, specifically teaching pain pathways in a clinical context.

Methods: A series of interactive bedside tutorials on pain pathways and their relevance to pain management was delivered using the HL2. Each tutorial included interaction with a patient during the postoperative period and a group of medical students who were situated in a remotely. The tutorial employed insertion of virtual artefacts, including examples of pain pathways often superimposed on or positioned adjacent to the patient. Student feedback was elicited using a modified Evaluation of Technology-Enhanced Learning Materials: Learner Perceptions (ETELM-LP) tool

Results: This was a prospective, observational study that used both qualitative and quantitative methods. Seven patients and 35 students participated across seven separate tutorials. The mean SUS score for medical students was 72.5 (IQR 62.5 – 80) and for the clinician was 70.5, indicating favourable usability. The mETELM Questionnaire using a 7-point Likert Scale demonstrated MR contributed to achieving the learning objectives of the tutorial (Median=6), and was superior to a traditional PowerPoint tutorial. There was disagreement among students regarding the value of the MR tutorial in comparison to a live patient encounter (Median=4). The patients' mETELM results showed that the HL2 created a safe environment during the session (Median=7), without affecting communication with the clinician (Median=7), and was favoured over small group bedside teaching (Median=7).

Conclusions: We demonstrated that bedside clinical teaching of pain pathways using the HL2 and MR is both feasible and effective, and could enhance vertical integration of basic and clinical material within a medical undergraduate curriculum. This study's collaborative application development model, involving tutors, facilitators, and curriculum experts, sets a precedent for future educational technology in healthcare. Further evaluation of the usability of the device in this context is planned.

54AP01-9

Hybrid 3D-printed manikin for lung isolation training of anesthesia residents: a randomized controlled trial

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Background and Goal of Study: Lung isolation is an essential technique in thoracic anesthesia. Commercially available high-fidelity lung isolation manikins to teach lung are costly and scarce in most training programs. We developed a 3D-printed modification that integrates with a simple airway manikin to enhance anatomical fidelity.

This study examined whether teaching lung isolation techniques using the modified hybrid manikin enhances skill acquisition compared to a standard, non-modified manikin.

Materials and Methods: Anesthesia residents were randomly assigned to participate in a lung isolation workshop using either the hybrid manikin or the standard manikin. They were then assessed for time to insert a double lumen tube (DLT), time to insert a bronchial blocker, time to identify the right upper lobe bronchus, and overall bronchoscopy score. All skills were re-assessed after two weeks, two months, and six months.

Results and Discussion: In total, 29 residents were randomized (hybrid manikin N=14, standard manikin N=15). Immediately postworkshop, the hybrid manikin group demonstrated higher success in DLT placement (86% vs. 53%, p=0.068) and shorter procedure times (median 26 seconds, interquartile range [IQR] 13–48 vs. 54 seconds, IQR 35–90; p=0.04).

Superior performance persisted at two months for DLT placement success (86% vs. 47%, p=0.03). At six months post-work-shop, the groups' performance converged, with both demonstrating significant improvements from baseline.

Conclusions: Training lung isolation with a 3D-printed hybrid manikin shows sustained benefits in bronchoscopy performance and lobar anatomy, with an immediate performance enhancement after the initial workshop.

This cost-effective modification has the potential to increase accessibility and improve skill acquisition for thoracic anesthesia training.

Ward nurses use of epidural analgesia when treating breakthrough pain. A National survey of Denmark

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Introduction: Epidural analgesia is an effective postoperative pain treatment reducing the administration of systemic opioids improving postoperative outcomes.

Studies have shown ward nurses lack education in epidural pain treatment

Our study investigated ward nurses' use of in-situ epidural catheters for postoperative pain treatment during breakthrough pain. Furthermore, we explored if educational programs are available, and the barriers experienced by ward nurses when treating breakthrough pain.

Method: Danish Nationwide survey targeting all abdominal and orthopedic surgical wards in Denmark. Head nurses from each ward appointed two ward nurses to answer the questionnaire. The survey took place from March-July 2023.

Result: In all, 104 of 121 (86%) ward nurses completed the questionnaire. Seventy-five (72.1%) used epidural bolus as first-line treatment for breakthrough pain. Education in epidural analgesia was available at 98% of surgical wards. Further, 47% reported getting formalized education, with 37 (35.6%) receiving it from a nurse or doctor (anesthesiology department or pain-team). The most frequent barriers to using epidural bolus were lack of knowledge (36.9%) or missing guidelines and instructions (29.1%).

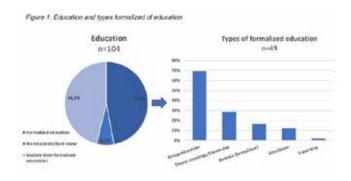
Conclusion: The majority of ward nurses administered epidural bolus as first line treatment for breakthrough pain. Only 47% of the nurses reported getting formalized education. Frequently reported barriers were lack of knowledge and missing guidelines and instructions.

Reference:

1.Bird, A., Rn, B. N. & Wallis, M. ISSUES AND INNOVATIONS IN NURSING PRACTICE Nursing knowledge and assessment skills in the management of patients receiving analgesia via epidural infusion. (2002)

	Gave bolus via epidural catheter		Didn't give epidural	
	n=75	95% CI	n=29	95% CI
Gave a systemic opioid (p.o, s.c/i.m/i.v)	42 (56.0%)	44.8-67.2	27 (93.1%)	83.9-100
Non-medical option (E.g. heating blanket or mobilization)	17 (22.7%)	13.2-32.1	10 (34.4%)	17.2-51.8
Gave non-opioid treatment (NSAID, paracetamol)	17 (22.7%)	13.2-32.1	7 (24.1%)	8.6-39.7
Contacted expert (E.g. doctor or nurse from the anesthesiology department or pain team)	17 (22.7%)	13.2-32.1	12 (41.4%)	23.5-59.3
Changed epidural infusion rate	12 (16.0%)	7.7-24.3	4 (13.8%)	1.2-26.3
Other (E.g. removal of catheter)	7 (9.3%)	2.7-15.9	6 (20.7%)	5.9-35.4

Table 1: First-line treatment for breakthrough pain, stratified for bolus via epidural catheter.



54AP01-11

An evaluation of peripheral intravenous cannulation training: insights from a UK-based survey of medical students and resident doctors

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Background and Goal of Study: Peripheral intravenous cannulation is the commonest procedure performed for inpatients and diagnostic investigations. Despite being low risk to patients, a range of cannulation related complications are still observed. The choice of insertion site is essential for the safe delivery of treatment (1).

Considerable variation exists in the approaches used to train medical students in cannulation.

Materials and Methods: To evaluate current clinical practice and university teaching methods, a survey was conducted amongst medical students from 14 different UK universities and resident doctors employed in UK hospitals, trained from 29 universities. A total of 250 invitations were distributed, yielding 104 responses - 64 from students and 40 from doctors.

Participants were asked to provide details on their venous cannulation training, including access sites emphasised during training compared to their current preference in clinical practice, as well as their experience with simulation and ultrasound techniques.

Results and Discussion: 95.2% of respondents received simulation-based cannulation training. Notably, 38.8% were trained to use the antecubital fossa and 37.9% the dorsum of the hand. However, clinically 42.3% preferred the dorsum and 26.9% the antecubital fossa. Some UK medical schools still emphasise the antecubital region, a site prone to flexion, risking mechanical obstruction, patient discomfort, brachial artery puncture, and arterial drug delivery (1).

Only 32.7% participants received ultrasound training for challenging cannulations, involving 8 students from 6 universities. Out of all resident doctors who had received ultrasound training, 38% were anaesthetists.

Conclusion: Students need comprehensive training in safe cannulation, including simulation-based teaching and site-specific risks and benefits. Guidelines should discourage flexor sites like the antecubital fossa as first-line options when better veins are available.

Ultrasound training must be integrated into curricula for difficult intravenous access. Anaesthetists can play a pivotal role in contributing to medical school initiatives or training medical students directly, ensuring the delivery of efficient and safe cannulation practices.

Reference:

1. Alexandrou E et al, Use of Short Peripheral Intravenous Catheters: Characteristics, Management, and Outcomes Worldwide. J Hosp Med 2018 May 30;13(5). doi: 10.12788/jhm.3039. PMID: 29813140

54AP01-12

Case closed? A decade of case report publications in the field of anesthesiology: A focused review

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Background and Goal of Study: Peer-reviewed medical journals tend to publish less case reports (CRs). We aimed to describe trends in publishing CRs in Anesthesiology peer-reviewed medical journals between January 2014 and August 2024.

Materials and Methods: We conducted a literature search using PubMed and Web of Science databases. Selection criteria involved identifying peer-reviewed CRs published within the last 10 years in the top 20 journals in Anesthesiology according to Journal Citation Reports (Clarivate, June 2024).

We identified published CRs adhering to "CARE reporting guidelines" for CRs, including the term "case report" or "case study" in their title.

Results and Discussion:: A total of 486 CRs were identified over the study period. Half of the top 20 Anesthesiology journals currently do not publish CRs, with 5 (25%) not publishing any CRs over the past decade. Two companion journals have been identified to provide a publication alternative for CRs.

Categorization of journals according to CR publication frequency established 5 (25%) journals did not publish any CRs; 7 (35%) published 1-19 CRs; 5 (25%) published 20-49 CRs, and 3 (15%) published >50 CRs during the investigated period. Obvious temporal trends were identified, with a continued downward trend in the number of published CRs.

Conclusions: Many leading peer-reviewed anesthesiology journals do not currently publish case reports CRs.

Nevertheless, the establishment of companion journals and the ongoing publication of CRs in various outlets indicate that they remain a valuable source of clinical information for both authors and readers.

54AP02-1

How smart is AI for EDAIC?: The success of artificial intelligence in the European diploma of anaesthesiology and intensive care exam

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Background and Goal of Study: Advancements in artificial intelligence (AI) have shown promise in medical applications, including standardized exams. The European Diploma of Anaesthesiology and Intensive Care (EDAIC) is a multilingual exam assessing

knowledge in anesthesiology and intensive care. This study evaluates the performance of ChatGPT 3.5, ChatGPT 4.0, Claude 3.5 Sonnet, and Gemini 1.5 Pro in EDAIC Part 1.

Materials and Methods: A total of 120 multiple-choice questions (MCQs) from the ESAIC official website were used. Each question included five true/false sub-questions, totaling 600 queries. The AI models were assessed across 9 basic and 6 clinical science subtopics. Correct response rates were calculated, and errors analyzed. No ethical approval was needed, as the study did not involve human participants or personal data.

Results and Discussion: On average, ChatGPT 3.5 answered 90.2%(541/600), ChatGPT 4.0 90.8%(545/600), Claude 3.5 Sonnet 90.8%(545/600), and Gemini 1.5 Pro 87.8% (527/600) correctly. Basic science scores (Paper A) were higher than clinical science scores (Paper B) across all models. ChatGPT 3.5 scored 92%(276/300) in Paper A and 88.3%(265/300) in Paper B, while ChatGPT 4.0 achieved 91.7%(275/300) and 90%(270/300), respectively.

The error rate was higher for clinical sciences, indicating limitations in handling experiential knowledge. Analysis revealed 22 questions consistently missed by all models, evenly split between basic and clinical sciences. Despite these challenges, the models surpassed the 2024 average pass rates for EDAIC Part 1 (65.66% for basic sciences and 68% for clinical sciences).

Chatbot	Correct Answers	Incorrect Answers	Total Questions	Success Rate (%)
ChatGPT 3.5	541	59	600	90.2
ChatGPT 4.0	545	55	600	90.8
Claude 3.5 Sonnet	545	55	600	90.8
Gemini 1.5 Pro	527	73	600	87.8

Chatbot	Paper A Correct	Paper A Incorrect	Success Rate (%)	Paper B Correct	Paper B Incorrect	Success Rate (%)
ChatGPT 3.5	276	24	92%	265	35	88.3%
ChatGPT 4.0	275	25	91.7%	270	30	90%
Claude 3.5 Sonnet	275	25	91.7%	270	30	90%
Gemini 1.5 Pro	267	33	89%	260	40	86.7%

Conclusion(s): Al models demonstrated strong performance in EDAIC Part 1, with ChatGPT 4.0 and Claude 3.5 Sonnet achieving the highest scores. However, limitations in interpreting experiential clinical scenarios remain. Integrating clinical case data into Al training could enhance their ability to support medical education and clinical reasoning.

54AP02-3

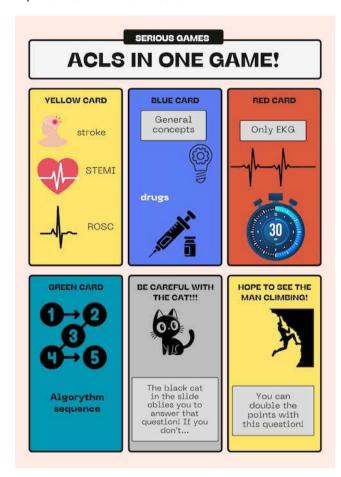
Serious games improve academic knowledge during ACLS simulation in medicine students

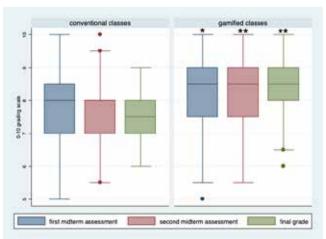
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Background and Goal of Study: Serious Games are innovative teaching tools that improve efficiency in the learning process. Some studies show the role of serious games in medical teaching, but there are limited results on their use in ACLS courses with medical students. This study aims to evaluate the effectiveness of serious games in improving learning skills in ACLS theoretical preparation.

Materials and Methods: The two comparison groups are the fourth-grade medical students who took the ACLS course in 2024, with traditional classes in the first semester (traditional group – TG) and gamified classes in the second-semester classes (gamified group – GG). Before the class, all the students watched a 7-minute video and received a text with all the content based on AHA guidelines.

For the gamified class, each student of GG received 4-5 cards of the UNO game®, which has four colors of the cards (figure 1). Both groups of students answered a survey about their learning experience at the end of the course.





There was no difference between groups in self-sufficiency, knowledge retention, or the perceived importance of each team member's role in the resuscitation.

Conclusion(s): Our data showed that gamified ACLS classes increased students' exam performance and retention of critical subject points. Teachers should consider this strategy when teaching crucial medical learning subjects.

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54AP02-4 Enhancing and Empowering Multi-Disciplinary Care in Tracheostomy Management

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Background and Goal of Study: Tracheostomy is a surgical procedure commonly performed for patients requiring prolonged mechanical ventilation or as an alternative airway in certain head and neck surgeries. The number of patients with tracheostomies has increased over the past few decades. Consequently, there is a growing need for adequate training amongst healthcare professionals to manage tracheostomies. Unfortunately, only specific surgical specialties and nursing units are trained to do so. Therefore, the team has designed a course in Basic Tracheostomy Care and Management to bridge this knowledge gap.

Materials and Methods: This course is led by a multidisciplinary team comprising nurses, respiratory therapists, and specialists from various fields. It is designed to promote interdisciplinary interactions, teamwork, and enhance familiarity with tracheostomy management, with the ultimate aim for better patient outcomes. Participants of various healthcare backgrounds underwent a halfday course of Basic Tracheostomy Care and Management from April 2021 to April 2024 in Changi General Hospital, a 1000-bed tertiary hospital in the eastern part of Singapore. Participants were asked to complete a pre-course survey, after which seven sets of pre-reading material specially curated by trainers of various disciplines covering basic airway anatomy, to maintenance and weaning of tracheostomies were released to participants. Any gueries were addressed during the course, which included five interactive stations including two crisis-simulations. A postcourse survey was then administered, and both survey results were analysed.

Results and Discussion: A total of 197 and 198 participants completed the pre- and post-course surveys respectively. 60.9% of participants had no formal training in tracheostomy care. Questions regarding crisis management of tracheostomies scored the lowest (45.9% correct), as compared to those regarding clinical knowledge (70.6% correct) and nursing (60.4% correct).

After the tracheostomy course, there was an improvement across all domains; 23.3% for crisis management (69.2% correct), 14.7% for clinical knowledge (85.4% correct) and 20.0% for nursing domains (80.5% correct).

Conclusion(s): Many of our healthcare professionals have limited exposure to tracheostomy management. The tracheostomy course has shown to improve healthcare workers' knowledge and management of tracheostomies.

*Both authors contributed equally as first authors.

54AP02-5

The situation and constraints in simulation-based medical education in anesthesia in China: data analysis from West China Hospital of Sichuan University

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Background and Goal of Study: Simulation-based medical education plays a crucial role in the training of anesthesia practitioners. To explore the current situation and constraints in simulation-based medical education in anesthesia (SBMD-A) in China, we analyzed data from a survey through eight years of national-wide Train the Trainers Course in Anesthesia Simulation (TTTC-AS) at West China Hospital of Sichuan University.

Materials and Methods: Anesthesia educators participated in the national-wide TTTC-ASs held at West China Hospital and completed a questionnaire regarding SBME-A in their institutions. Results and Discussion: From 2014 to 2024, eight sessions of national-wide TTTC-ASs were held. Five hundred and seventynine anesthesia educators from 205 institutes or hospitals in China completed the survey. Results showed the number of dedicated simulation centers is increasing (2015: 59% vs. 2024: 68%). For simulation modalities and technologies, an increase was observed in task trainers (2015: 11% vs. 2024: 36%) and visual reality (VR) devices (2015: 6% vs. 2024: 13%), while high-fidelity simulation declined (2015: 83% vs. 2024: 30%). Biological resourcebased simulation remains low (6%-8%), and standardized patients have increased since 2016 (2016: 8% vs. 2024: 16%). In all SBME-A curricula conducted, the proportion of procedural skills ranks first (2015: 42% vs. 2024: 32%), and that of crisis resource management (2015: 11% vs. 2024: 26%), ultrasound-guided technigues (2015: 14% vs. 2024: 22%), VR (2%-6%) and computerbased simulations (1%-13%) are rising, while BLS/ACLS declined (2015: 33% vs. 2024: 11%). SBME-A activity frequency has increased from generally twice a year (2015: 92% vs. 2024: 29%) to more than once per month (2015: 45% vs. 2024: 44%). Systemization of integrating simulation in patient safety is on the rise (2015: 11% vs. 2024: 38%). Constraints include the dedicated time for teaching (2015: 28% vs. 2024: 15%), and lack of curriculum standards (2016: 9% vs. 2024: 11%). In the past decade, SBME-A in China has achieved great progress in simulation center construction, equipment availability, curriculum development, and educator training. However, dedicated time for teaching and lack of curriculum standards are still constraints for SBME-A in China. Conclusion(s): More attention should be paid to the lack of dedicated teaching time and curriculum standards for SBME-A in China in the future.

54AP02-6

Validation of metrics for midline catheter placement using modified Delphi methodology

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Background and Goal of Study: Midline catheters are peripherally inserted vascular devices that end inferior to axilla. Midline insertion failure rate has been reported to be as high as 12.5%. Proficiency based progression (PbP) training based on unambiguously defined metrics is an innovative methodology in which a trainee must attain certain proficiency level before performing the skill in clinical setting. It has been reported to improve performance in simulation and clinical settings. We are aiming in this study to validate the previously defined metrics for midline catheter placement (50 metrics and 30 errors of which 12 are critical and the rest are non-critical) using modified Delphi methodology. These validated metrics will be used as a core for PbP training.

Materials and Methods: Delphi methodology has been extensively used before to achieve consensus among a group of experts through multiple rounds and voting. This involved two electronic voting rounds via an online survey tool (Google Forms) followed by a virtual round table discussion (Microsoft Teams) to exchange views and finalise results. Collaborators are experts in the field of vascular access devices who are practicing midline placements regularly. They were invited to participate via the National Infusion and Vascular Access Society (NIVAS). In round 1 all items which achieved more than 50% of voting passed to round 2, any item achieved less than 50% was reworded and passed for voting in round 2. In round 2 all items which achieved more than 75% were included in the final list of metrics. Items which achieved between 50-74% were discussed in round 3. Items which achieved less than 50% were rephrased and included for voting in round 3.

Results and Discussion: 22 experts participated in round 1, 24 in round 2 and 6 in round 3. 12 metrics needed rephrasing in round 1 and 2. Only 7 metrics and 3 errors did not achieve consensus in the first two rounds and had to pass to round 3 in which they were rephrased and achieved consensus except one item which has been combined with another metric after round table discussion. (Table 1 and 2)

Conclusion(s): Using modified Delphi methodology, 49 metrics and 30 errors for midline catheter placement were validated.

- 1. Failure to identify arterial puncture (critical)
- 2. Pulling the wire through the needle (critical)
- 3. Repositioning the needle with the wire inside (critical)
- 4. Not confirming the guidewire inside the vein before dilatation (critical)

Table 1: Sample of validated errors.

- 1. Adjust ultrasound settings: high frequency probe selection, depth and gain
- 2. Check the orientation of the ultrasound probe
- 3. Hold the probe in a tripod grip (stable and anchored to the patient)
- 4. Identification of important structures: Median nerve, Brachial artery and Brachial vein
- 5. Vein selection: diameter of the vein is 3 times diameter of the line

Table 2: Sample of validated metrics.

In situ multidisciplinary simulation - an effective educational tool for management of operating room emergencies

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Background and Goal of Study: Operating room (OR) emergencies are rare, time sensitive events requiring a rapid and coordinated multidisciplinary team intervention. In-situ simulations provide a safe and effective learning environment. We used in-situ multidisciplinary simulations as an educational aid and evaluated relevant clinical knowledge, performance, and satisfaction of participants via surveys.

Our goal was to find significant gaps in knowledge, communication, or familiarity with a new operating room domain that may impact patient safety.

Materials and Methods: We simulated a cardiac arrest due to local anesthetic systemic toxicity (LAST) in a young patient. Each participating team included an anesthesia resident and staff, two surgeons, two OR nurses and one ancillary staff member.

Each simulation was overseen by a supervisor from each discipline and two additional simulation operators that operated and recorded mandatory actions via checklists. Simulations were also video-recorded for future analysis.

Results and Discussion: In total, 23 participants completed self-assessment surveys (26% surgery residents, 26% anesthesiologists, 35% nurses, and 13% others). Most participants reported improved confidence (95%), knowledge (78%), communication (91%), and wished to participate in future simulations (95%).

Supervisors reported that most teams (85%) rapidly requested and administrated intralipid, while only one team (14%) advanced management to extracorporeal membrane oxygenation.

When screening for theoretical knowledge, both anesthesiologists (90%) and surgeons (83%) scored well on differential diagnosis, though surgeons lacked knowledge regarding treatment options (20%). As for practical knowledge (location and usage of intralipid), anesthesiologists and OR nurses performed well (90 and 100% respectively).

Our survey results and the difficulty of finding the intralipid during simulation led to new OR signage of the location of intralipid with attached treatment checklist for LAST which was utilized during simulations.

Conclusions: In-situ multidisciplinary simulations captured as a positive learning experience by participants. In addition to increasing clinical knowledge and teamwork skills, we found an increase in confidence.

Performing in-situ simulations in real-life environments exposes latent challenges and safety issues which can then be addressed to improve future patient care.

54AP02-8

Perioperative nutritional support of patients with Inflammatory Bowel Disease in - screening, assessment and management of perioperative malnutrition in tertiary hospital in Serbia

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Background and Goal of Study: Inflammatory bowel disease (IBD) is a group of intestinal disorders characterized by chronic digestive tract inflammation. While non-surgical management approaches have advanced, many patients still require surgical treatment. Optimizing preoperative patient care is crucial to achieving favorable surgical outcomes.

The goal of this work was on the awareness of preoperative nutritional therapy and the role of healthcare professionals in preoperative assessment, and management principles in patients with IBD in tertiary hospital in Serbia.

Materials and Methods: This research was conducted by filling out an anonymous questionnaire consisting of twenty-four questions online. The questionnaire was distributed online by professional associations, and the target were doctors specialized in anesthesiology, gastroenterology, and surgery. Statistical analysis was performed using SPSS 21.0.

Results and Discussion: The response rate was 72.9% among anesthesiologists and surgeons, 20.3% but very low among gastroenterologists. In our hospital, perioperative nutritional support is mainly performed by anesthesiologists (40.7%). Only 12.1% of respondents perform regular Nutritional support for patients with IBD. The most common screening tools used in clinical practice are Nutritional Risk Screening 2002 (55.9%) and Mini Nutritional Assessment (23.5%). The most used tools for nutritional assessment are anamnesis, physical exams and laboratory tests. 44.1% of respondents still determine how long Nutritional support should be done preoperatively.

Modern guidelines for preoperative starvation are performed in 54.2%. In the preoperative period, 90.1 percent of nutritional support combines enteral and parenteral nutrition.

Oral intake of liquid carbohydrates before surgery is done in 21.1%. All respondents agreed that the main challenges are knowledge, organizational support, time, and resources.

Conclusion(s): No specific preoperative nutritional support was used regularly, and methods and timing are still diverse. Further work on education, implementation, and identifying clinical needs and benefits for nutritional support in patients is vitally needed.

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54AP02-9

The effect of participation in Student-as-Teacher programs on feedback-seeking behaviour in the clinical life of the residents

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Background and Goal of Study: At Masaryk University in Brno, Czechia, General Medicine and Dentistry students could participate in the Student-as-Teacher program (SaT). In this program, students are trained in the basics of adult learning theories, simulation-based education, debriefing, and more profound training in theory and skills in the subject (e.g. first aid). After this training, students participate as assistant teachers during the practices. The positive effect of the peer-to-peer learning concept has already been proven.

In this study, we focus on the influence of this training on the student's perception of feedback and simulation training in their residency.

Materials and Methods: These data were obtained from an online questionnaire distributed by email, and its completion was strictly anonymous and voluntary. The study population consisted of students who finished the training in this program, actually taught during their studies, and have already graduated. 90 residents received the questionnaire, and 17 participants completed the survey in one week (21.11.2024-29.11.2024).

Results and Discussion: 100 % of participants claim that participation in the SaT program influenced their perception of feedback. 94.1 % of participants expect the feedback to be a normal part of their work life, 82.4 % are less afraid of feedback, 94.1 % expect feedback not only after major mistakes, and 95.0 % of participants expect feedback daily in a daily manner.

Improvement in giving feedback and working through receiving one constructively was stated in 88.2 % and 94.1 %. The participants are not satisfied with the frequency of receiving feedback (58,6 %), feedback culture (76,5 %) and constructiveness (64,7 %).

The approach to simulation postgraduate training was also altered. Participants feel more motivated to participate in optional training in 59.0 % and obligatory simulation training in 25.0 %. Their fear of simulation and debriefing was lessened (46.0 %), and their motivation for completing pre-learning was higher (21.0 %)

Conclusion(s): Participation in simulation education as a lector positively influences perceiving feedback and simulation training even after graduation. This kind of training promotes feedback-seeking behaviour and sets expectations on high standards of feedback culture.

Acknowledgements: Many thanks to Václav Vafek and Daniel Barvík for co-leading the SaT programs and our student lectors.

54AP02-10

Implementation of simulation-based lectures to enhance knowledge retention in anesthesiology residents

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Background and Goal of Study: Improving the quality of training for medical residents is one of the primary goals of modern medical education. Among innovative approaches, simulation-based lectures stand out as a method that effectively integrates real-life clinical scenario modeling with theoretical training. This integration has the potential to facilitate deeper understanding and retention of material.

The aim of this study was to evaluate the effectiveness of simulation-based lectures compared to online learning in improving the knowledge of first-year anesthesiology residents.

Materials and Methods: The study involved 67 first-year anesthesiology residents (aged 23–27 years), including 32 men (47.8%) and 35 women (52.2%). The residents were divided into two groups based on the learning format for the topic "Preoperative Patient Assessment": 38 residents attended a simulation-based lecture at the department (Group 1), while 29 residents attended an online lecture (Group 2).

Learning effectiveness was assessed using initial test results (15 questions) and a follow-up test conducted one month later. The retention coefficient was calculated as the ratio of follow-up test results to baseline knowledge levels. Statistical analysis was performed using XL-STAT software.

Results and Discussion: Initial test scores showed no significant difference between the groups: 60.2±4.32% in Group 1 versus 62.4±5.27% in Group 2 (p=0.305). One month after the lectures, test scores in Group 1 significantly increased to 76.3±5.17% compared to baseline (p=0.001), while in Group 2, scores rose to 71.9±8.13%, also showing a significant improvement over baseline (p=0.011).

However, the test results in Group 1 were significantly higher than those in Group 2 after one month (p=0.033). The retention coefficient was also higher in Group 1 compared to Group 2 (1.28 (1.15;1.42) versus 1.16 (1.08;1.27), p=0.019).

Conclusion(s): Simulation-based lectures are an effective tool for improving the quality of anesthesiology residents training and provide higher levels of knowledge retention over time. A simulation-based lecture is a novel form of instruction that differs from traditional simulation exercises by better integrating theoretical knowledge into a practical context, thus enhancing learning effectiveness.

The results of this study support the incorporation of simulationbased approaches into educational programs for anesthesiology residents

54AP02-11

Feasibility study of a novel 5G-connected mobile video recording and review system for educational and research application in anaesthetic in-situ high-fidelity simulation training

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Background and Goal of Study: We aimed to develop, implement and evaluate a mobile system using off-the-shelf components, to record and review simulations and debriefings in four separate rooms during standardized simulation courses at multiple centres in Sweden. Our requirements were: high quality sound and video; easy to install, use and demount; suitable for transport by courier; no requirement to use personal mobile devices; not dependent on local intranet; GDPR compliant; automatic remote long-term storage.

Materials and Methods: Four sets of the components shown in Table 1 were acquired to record simulations and debriefings, each with its own 5G internet connection. The equipment fits in a standard transport case, total weight 25kg. Automatic storage is at a remote server (AXIS Camera Station S2208). Faculty access recordings during courses using the AXIS Camera Station® app on iPads.

1-2 AXIS M3086-V stationary wide-angle (120°) dome cameras mounted on 16x16cm electrical blanking plates

AXIS T8355-A microphone; AXIS T6101 MkII interface

AXIS S3008 Recording unit

Teltonica RUTX50 5G Router providing ethernet connection for recording unit and Wi-Fi for course faculty

Table 1. Components of each recording set.

Results and Discussion: The study ran during 7 courses at 5 centres in 2024 (1), comprising 100 full-scale simulations, both in-situ in the OR and ICU, and at simulation centres. Ease of installation, video-review, demounting and packing were acceptable, transport unproblematic. Sound and picture quality was generally good and participants did not appear to be perturbed by the cameras. Towards the end of the study, faculty were encouraged to show recordings of laudable debriefing techniques used by their peers, which resulted in lively and constructive discussion during faculty meetings.

Video review of simulations in medical education is widespread even though evidence of its superiority to non-video-assisted debriefing is sparse. Video-review of debriefings in facilitator development programmes is less well described (2): our group believes it is useful and should be formally evaluated. Future developments may include AI analysis of both simulations and debriefings.

Conclusion(s): A mobile recording system complying with our specifications is feasible.

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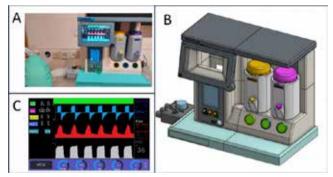
54AP02-12

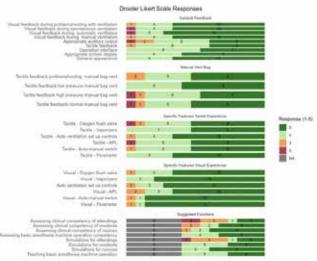
Face and content validation of a 3D-printed, open-source anesthesia machine simulator

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Background and Goals: Medical simulation is essential for medical training, standardizing teaching and competency evaluation. Using anesthesia machines (AM) in simulation allows appropriate responses to clinical situations. AMs provide feedback that anesthetists rely on to diagnose clinical problems. However, their use is often limited to operating rooms or specialized centers, restricting availability. Additionally, AMs function poorly in simulations and lack operator control of display. We developed "The Drooler", a portable, cost-effective, and reproducible 3D-printed, open-source AM Simulator (AMS) (Figure 1).

This study aimed to evaluates the **face** and **content validity** of the AMS, focusing on its realism and suitability for anesthesia training.





Materials and Methods: We present preliminary data of a survey study including 15 participants (9 are simulation instructors). Participants engaged in **directed sessions** using the AMS and completed a survey for:

- · Face validity: Visual, tactile, and auditory Realism -assessed by anesthetists (>1 year experience)
- **Content validity**: Suitability for anesthesia simulation- assessed by simulation instructors (>10 simulations experience)
- · Likert Scale (1-5) evaluations were used for scoring.

Results and discussion: Preliminary results are presented in Figure 2.

Conclusions: We report consistent face validity of the AMS with excellent visual and tactile realism scoring, in dynamic clinical situations. We report content validity, as the AMS was highly appreciated as an educational and assessment tool by experienced simulation instructors. We plan to further evaluate the validity of the AMS in larger population of anesthetists including simulation instructors. In conclusion the Drooler AMS offers a novel, accessible solution for anesthesia training and skills assessment outside high-fidelity settings.

54AP03-1

Bottom-up feedback: Stress test for teams or key to enhancing education and team culture? How residents and faculty in an anesthesiology and intensive care department addressed this challenge

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Background and Goal of Study: Traditionally evaluation in medical education is executed top down where trainees are rated once a year by their consultants. However, it is increasingly recognized that the professional development of residents towards independent practice is significantly influenced by a supportive learning environment, the expertise and commitment of faculty, and the overall quality of educational practices.

Materials and Methods: With the aim of enhancing the skills of both trainees and educators, we strive to cultivate a positive feedback culture based on psychological safety. To attain this goal, we focused on faculty development by implementing a bottom-up feedback system in which consultants are evaluated by residents regarding their teaching competencies. For this purpose, the SwissSETQ-Questionnaire[1] was used.

Given that bottom-up feedback may challenge the traditional hierarchical structures prevalent in hospitals, we sought to identify potential concerns and expectations related to the use of Swiss-SETQ. Therefore, we evaluated the implementation of the Swiss-SETQ by conducting a pre- and post-survey. We assessed the attitudes of residents and faculty members towards bottom-up feedback, feedback practices in general, and their perceptions of the current working climate within our institution. The questionnaire was developed in collaboration with an occupational psychologist and incorporated adapted items from validated questionnaires previously utilized in similar contexts (e.g. student-teacher evaluations). Items were rated on a 5-point Likert scale.

Additionally, two open-ended questions addressed concerns and expectations. One month after the implementation of the Swiss-SETQ, the post-survey was conducted to re-evaluate whether initial concerns and expectations had been proven true.

Results and Discussion: This poster presents the findings from the pre- and post-evaluation, alongside insights and experiences gained from the first implementation of a bottom-up feedback using the SwissSETQ.

Conclusion(s): Based on our findings, we conclude that bottomup feedback represents a powerful tool to enhance the quality of education and to promote a positive team culture. We highly encourage other institutions to adopt bottom-up feedback to achieve similar benefits.

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54AP03-3

Role-switching in internal jugular vein catheterization training on skill acquisition: a cognitive load theory-informed randomized controlled trial

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Background and Goal of Study: Internal jugular vein catheterization (IJC) is a commonly used vascular access technique in clinical practice, yet it poses significant learning challenges for novices. We hypothesized that incorporating a role-switching component, where trainees design a skill assessment checklist of IJC during training, might improve the acquisition of IJC skills. Materials and Methods: Interns with no prior landmark-based IJC experience were invited to self-study theoretical knowledge materials of IJC, including PowerPoint presentations and IJC operation videos emphasizing the key points. Following a knowledge test, those who passed were randomly assigned to the control group (Group C) and the intervention group (Group I). Both groups then underwent an IJC skill pre-test. After that, Group C received one-hour simulation-based IJC skill training with an instructor-trainee ratio of 1:12, and feedback was given by an instructor. Group I was required to design an IJC skill assessment checklist in 20 minutes without the intervention of an instructor, using an endotracheal intubation skill assessment checklist as a reference. It was emphasized that the checklist should reflect the key points of IJC skills. Subsequently, Group I practiced IJC skills for 40 minutes and received feedback from the instructor. One week later, both groups underwent an IJC skill post-test and completed a cognitive load test. A separate IJC skill assessment checklist (with a full mark of 100) used in the pre and post-test was not exposed to the trainees.

Results and Discussion: Forty-eight interns were included, with 24 in each group. IJC skill pre-test scores were not significantly different (Group I vs. Group C: 55.3±6.1 vs. 54.3±7.9, P=0.64). Post-test scores were significantly higher in Group I (91.0±2.8 vs. 88.5±4.6 in Group C, P=0.03). There was no significant difference in total cognitive load (Group I: 334.7±63.6 vs. Group C: 311.1±57.8, P=0.82). Group I had significantly lower frustration scores (25.1±15.3 vs. 42.3±22.4, P=0.00). Incorporating role-

switching in IJC skill training, where students allocate some of the time originally used for skill practice to designing an IJC skill assessment checklist, switching their role from trainee to skill assessor, enhanced active learning, increased germane cognitive load, and reduced frustration.

Conclusion(s): Role-switching in IJC training improved skill acquisition.

54AP03-4

Cardiopulmonary resuscitation training in midlle school: start them young!

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Background and Goal of Study: Out-of-hospital cardiac arrest is the third leading cause of death in Europe [1]. Immediate initiation of Cardiopulmonary Resuscitation (CPR) can triple survival rates. Children's education is one way to improve health literacy and rationalize healthcare costs. Several organizations recommend mandatory annual CPR training of 2 hours for school-aged children, integrated into the school curriculum [2]. Investing in health literacy, starting from school age, can shorten the time to initiate proper CPR, reducing morbidity and mortality [3]. Our main goal was to assess the impact of CPR training (2 hours with simulation) for children aged 12-14 on promoting health literacy, comparing questionnaire results before and after the training. Secondary goal included comparing before training questionnaire results between children with previous CPR training and those without.

Materials and Methods: A diagnostic questionnaire, with eleven theoretical questions about CPR, was applied before and after the training. Informed consent was obtained from parents or guardians to administer the tests and analyze the data. Descriptive statistical analysis of demographic data was performed. The results were converted into dichotomous nominal variables "70% correct answers" and "not 70% correct answers" and inferential statistic was applied using the Chi-square test (p-value 0.05).

Results and Discussion: Questionnaires from 72 children attending the 8th grade were analyzed. The median age was 13 years old. Before the training, 34.7% of the children achieved "70% correct answers," increasing to 98.6% after training (p-value <0.001). Among the children with prior CPR training (29.2%), 33.3% achieved "70% correct answers" in the initial questionnaire, compared to 36% among those without prior training (p-value 0.82). Additionally, 95.7% of the children reported that learning about CPR was important.

Conclusion(s): The results demonstrate that middle school children can acquire basic CPR knowledge through adapted training sessions, which can contribute to improving health literacy. However, regular training is necessary to reinforce knowledge. This study highlights the importance of training children in CPR as a way to enhance health literacy.

References:

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54AP03-6

Competency based medical education (CBME) in prehospital emergency medicine – curriculum development, validation and definition of core skills using Entrustable Professional Activities (EPAs)

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Background and Goal of Study: The implementation of competency based medical education (CBME) poses the challenge to evaluate competencies quantitively. ¹ Entrustable professional activities (EPAs) bridge this gap by combining theoretical and practical aspects of a broader task and allow a gradual entrustment to learners. ² Although challenging and practical disciplines like prehospital emergency medicine could benefit greatly from EPAs, such curricula have not been defined yet. To fill the gap, this study aimed to define and validate EPAs for core skills in prehospital emergency medicine.

Materials and Methods: The study was conducted at the department of Anesthesiology at the University Hospital Hamburg, Germany. A multi-step, modified delphitrial, combined with expert analysis and interviews was used to define and validate EPAs for prehospital emergency medicine. The EPAs were accepted for the final curriculum based on the consensual agreement (>80%) and sorted by relevance, reflected by the content validity index (CVI)

Results and Discussion: In the first delphi round 311 replies by 41 participants were analyzed by the expert group and 22 EPAs defined. Following, an adaptation process consisting of 11 individual expert interviews and an additional expert group analysis, led to a total of 18 EPAs. The mean agreement on the EPAs in the second delphi round with 70 participants was 95%. 17 EPAs met the criteria and were accepted in the final curriculum. EPAs were separated in a high (CVI>0.75) and low ranking (CVI<0.75) group, reflecting the importance inside the curriculum. The ranking differed significantly between participants with or without the prehospital emergency medicine certification (p=0.03). Implementing EPAs could lead to identifying overlapping competencies between different specialties and design a more efficient training. Furthermore, the results should be evaluated interdisciplinary in national and international approaches to reach a broad consensus on the future prehospital medical education.

Conclusion(s): This study defines and validates the first EPA based curriculum for prehospital emergency medicine in Europe. **References:**

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54AP03-8

EDAIC certification and one step forward for anaesthesia and intensive care education in Bangladesh

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Background and Goal of Study: The European Diploma in Anaesthesia and Intensive Care (EDAIC) certification is a recognised global standard for expertise in anaesthesia and intensive care. Professionals obtaining this certification gain better access to various career opportunities in multiple countries. This survey aims to assess the impact of EDAIC certification on professional development and educational standards in anaesthesia and intensive care of Bangladesh.

Materials and Methods: An online survey was done on anaesthesiologists and intensivists of Bangladesh who have passed the EDAIC Part 1 or 2 exams to evaluate the impact of EDAIC certification on anaesthesia and ICU education, along with feedback on its influence on professional development and clinical skills.

Results and Discussion: A total of seventy-seven participants responded to the survey. Most respondents were anaesthesiologists (87.01%), followed by intensivists (6.49%). Postgraduate qualifications include DA (61%), FCPS (19%), MD (13%), and MCPS (7%). About 37.6% have over 5 years of work experience. Most of the participants were from academic institutes (48.05%). and the rest were from private hospitals (22.8%), district Hospitals (12.9%), and sub-district hospitals (5.19%), Approximately 48.05% of respondents completed EDAIC part 1, and 7.58% passed part 2. Amongst the EDAIC achievers, 54.5% expressed advanced expertise in clinical reasoning, meanwhile 15% stated escalated dignity professionally. Upliftment in practicing safe anaesthesia (40.63%) and rendering better ICU services (15.6%) was also observed. About 94.3% acknowledged the implementation of the knowledge and skills acquired from the EDAIC exam in teaching and training programs for future anaesthesiologists and intensivists of Bangladesh.

Conclusion(s): EDAIC certification has significantly improved anaesthesia and ICU education in Bangladesh by strengthening clinical competencies, updating knowledge, and enhancing professionals' educational development and recognition.

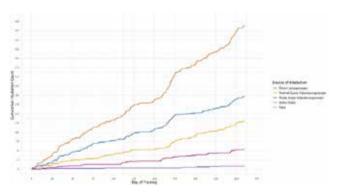
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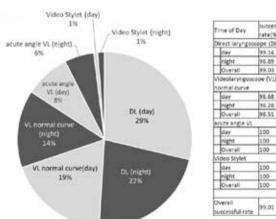
Assessing skill acquisition in a resident anesthesiologist over 260 days: impact of diverse intubation tools and night shift training on competency development

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Background: Endotracheal intubation is a fundamental skill in anesthesiology, essential for airway security and patient safety during surgery. Proficiency is crucial for managing diverse clinical scenarios.

Case Report: A first-year anesthesiology resident completed a 260-day training program focusing on four intubation devices: direct laryngoscope(DL), normal curve video laryngoscope(VL), acute angle VL, and video stylet. Between August 4, 2023, and April 30, 2024, the resident attempted 447 intubations; 404 cases were analyzed after excluding incomplete data or double-lumen tube usage. The resident completed 206 intubations with DL, 134 with VL, and 56 and 8 with Acute angle VL and video stylet. Daytime intubations were more frequent, with DL and VL used in 29% and 19% of cases, while night shifts accounted for 22%(DL) and 14% (VL).





Discussion: The resident demonstrated steady skill acquisition across all devices, reflected in high success rates. Exposure to multiple tools enhanced adaptability and proficiency. Night shifts provided opportunities to handle complex cases, fostering resilience and aligning with Kolb's experiential learning theory, which emphasizes learning through experience. Ericsson's concept of deliberate practice also applies, as repeated practice with feedback is essential for mastery. Structured debriefing and mentor-

ship can enhance learning and mitigate burnout. Individual differences may affect skill acquisition rates, indicating that peer-level comparisons are needed to optimize training programs.

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Learning Points: Diverse exposure to intubation devices accelerates skill development, and night shifts enhance clinical competence through complex cases. Incorporating educational theories, such as experiential learning, improves training and resident well-being.

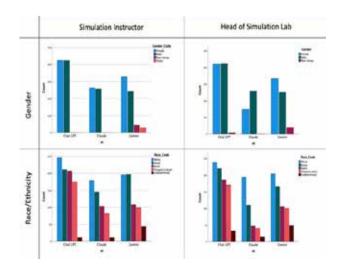
54AP03-10 Diversity in simulation: can Al pass the inclusion test?

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Background and Goal of Study: Simulation-based medical education (SBME) plays a crucial role in healthcare training, with the workforce of simulation labs influencing curriculum development and inclusivity. While artificial intelligence (AI) introduces innovative tools for demographic analysis, it also has the potential to perpetuate systemic biases.

This study explores the capability of AI tools to assess demographic diversity among SBME leaders.

Materials and Methods: Three Al models - ChatGPT, Gemini, and Claude – were used to generate demographic data of simulation lab instructors and leaders across nine countries over five days in November 2024. Analysis focused on demographic patterns in age, gender, race, and specialty, aiming to evaluate inclusivity and identify trends or disparities in the data generated by these Al models.



Results and Discussion: We analysed 3894 entries. Claude emerged as the most inclusive tool, demonstrating a balanced distribution across gender and racial/ethnic groups, with a higher proportion of women and equitable representation of minorities (Fig 1.). ChatGPT showed the least diversity, with a pronounced overrepresentation of males and White individuals in leadership roles. The most frequently mentioned medical specialities associated with SBME were Anaesthesiology, Emergency Medicine, Surgery, Internal Medicine and Pediatrics, accounting for over 50% of all mentioned specialities.

Conclusion(s): Al tools offer significant potential for analyzing diversity among SBME leaders but also reflect inherent biases. Future efforts should focus on improving the diversity representation capabilities of AI tools to ensure unbiased insights that enhance SBME workforce inclusivity.

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54AP03-12 Acute pain in Portugal and Europe – A long way to go

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Background and Goal of Study: For several years, Anesthesiology has witnessed significant advancements in Acute Pain. The development of regional techniques and the diversity of adjuvant strategies available have contributed to this progress. However, postoperative pain management in Portugal and Europe remains ineffective, with "lack of organization" being widely recognized as one of the main obstacles.

Materials and Methods: The implementation of Acute Pain Units (APUs) in European hospitals began decades ago. In Portugal, the first recommendations from the Portuguese Society of Anesthesiology (SPA) were published in 2018. However, their applicability has fallen far short, with only about 37% full implementation nationwide. Across Europe, the situation is highly varied. In the United Kingdom, Germany, and Netherlands, the percentage of hospitals with available APUs is around 90%; in France and Austria it's approximately 50% and 40%, respectively. Other countries, like Hungary, have an implementation rate less than 10%. Despite this variability, all these countries recognize the importance of APU implementation to pain management improvement. In 2024, CUF Tejo Hospital, in Lisbon, Portugal, implemented an APU based on SPA recommendations. The project began in 2023 and follows a nurse-centered model, similar to most models implemented across Europe.

Results and Discussion: Although our patient sample is still insufficient for a comprehensive outcome analysis, we already perceive very positive feedback from users. We can highlight that our greatest challenge has been the lack of human resources, particularly nursing staff. This is a problem shared by other European countries, especially those with lower adherence rates. In countries with higher adherence rates, contrary to expectations, moderate to severe postoperative pain remains highly prevalent, suggesting that the lack of standardization across Europe and even within individual countries contributes to the inefficacy of pain management.

Conclusion(s): At a time when the focus is on quality, what are the main reasons hindering effective acute pain control in European hospitals? Is it merely a matter of human resources? Would the creation of European guidelines enabling standardized practices and improved outcomes be beneficial? The question remains...

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Career and Wellbeing

55AP01-1

Comparison of in-simulation versus post-simulation debriefing in medical Simulation **Based Training (SBT)**

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Background and Objective: Simulation-Based Training (SBT) is commonly used to train medical personnel in skills, knowledge, and teamwork within a realistic environment. Traditionally, postscenario debriefings are essential for reinforcing learning, allowing learners to understand the direct consequences of their actions. An alternative approach is in-scenario debriefing, which involves pausing the simulation to discuss specific events. However, pausing the scenario may affect both fidelity and learner engagement. This study investigates how learners perceive in-scenario debriefing compared to traditional post-scenario debriefing and examines perception differences among various learner populations in postgraduate medical education.

Materials and Methods: The study compared in-scenario debriefing with post-scenario debriefing among Certified Registered Nurse Anaesthetists. Postgraduate MDs (Year 1 and Year 3), and Certified Specialists in Anaesthesiology. During each pause, participants and facilitators temporarily left the manikin for a facilitator-led debriefing focused on the simulation, fostering reflection-in-action and reflection-on-action while addressing clinical, social, and cognitive skills. The pauses were kept under five minutes. Learners' perceptions were assessed using an adapted instrument and semi-structured interviews. Traditional post-debriefing scenarios were also included in the course day. Results and Discussion: Eighty-eight participants completed the

questionnaire, with scores ranging from 39 to 75 (mean of 57), and a median score of 4 per question (range 1-5), with a mean of 3.81. Twenty learners and seven facilitators participated in interviews (20-40 minutes). Participants reported that in-scenario debriefing effectively promoted engagement, learning, and reflection without diminishing the fidelity of the scenario. Reflection-inaction allowed participants to enhance their expertise by cycling between action and reflection. Learners indicated they had no difficulty re-engaging after the pauses, regardless of their professional background or experience level.

Conclusion: In-scenario debriefing is an effective tool in SBT and could serve as a viable alternative to traditional post-scenario debriefing. It supports active engagement, adaptability, and learning for individuals across diverse levels of medical education and simulation experience.

55AP01-2

Virtual reality and simulation-based training in tracheal intubation competency

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Background and Goal of Study: Tracheal intubation is a critical skill in anesthesiology and emergency medicine. While lecturebased learning remains essential, simulation techniques, including manikin training and virtual reality (VR), are increasingly used to enhance practical skills (1,2). This study compared the effectiveness of these three educational methods for tracheal intubation training.

Materials and Methods: 33 participants were divided into 3 groups: lecture-only, lecture plus manikin training, and lecture with VR simulations. The manikin group combined lectures with practical sessions, while the VR group used immersive simulations of intubation scenarios. This design allowed comparison of theoretical, tactile, and immersive approaches.

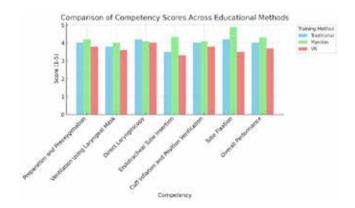
Results and Discussion: Competency was assessed across seven steps: preparation, preoxygenation, ventilation (LM), direct laryngoscopy, endotracheal tube (ETT) placement, cuff inflation, ETT fixation, and overall execution, scored on a 5-point scale (1 = unable to perform, 5 = independent).

The manikin group scored highest overall, particularly in ETT insertion (mean 4.33 \pm 0.71, p = 0.043). The VR group scored lower in tasks requiring tactile feedback, like ETT insertion. No significant differences were found in direct laryngoscopy (p = 0.433) or cuff inflation (p = 0.322).

Conclusion(s): Manikin-based training is more effective for developing tracheal intubation skills than lecture-only or VR-based methods, as tactile practice is crucial for manual procedures. While VR offers innovative potential, its current lack of tactile realism limits its utility. Future advancements in VR could improve its role in medical training.

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Adaptive refinement of a critical incident debriefing and support program for anaesthetists at a major trauma centre informed by clinician stakeholder needs analysis

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Background and Goal of Study: Clinical incident debriefing (CID) benefits patients, clinicians, and organisations[1]. We investigated psychological safety and experiences of CID to develop a feasible yet impactful program for our major trauma centre. Following implementation, we evaluated experiences of the program.

Materials and Methods: Anesthesiologists were invited to complete a baseline survey investigating psychological safety, past critical incident(CI) and CID experiences. After analysing the survey results, we recruited four focus group (FG) sessions. A bespoke program was designed for identified stakeholder needs and introduced into practice. The program was evaluated through a survey and three post-program FGs with anesthesiologists. Descriptive statistics were used to report survey data. The FGs were recorded, transcribed, and the content was thematically analysed. Results and Discussion: Baseline survey responses were obtained from 55/111 anesthesiologists (49.5%) and psychological safety was high. 38% of CIs occurred after hours, and relief from clinical duties was uncommon. Those who participated in CID found it useful(75%). From the FGs, CID was reported as important and acceptable. The main barrier to CID was logistics, and the purpose of the debrief was not always explicit (clinician wellbeing vs. incident review). The CID process was developed in partnership with our hospital Wellbeing team. The program evaluation survey received 54 responses(49%) - staff identified increasing availability of CID as a positive program outcome. Post-CI relief from duty was more common but future opportunitied included more training and overcoming logistic barriers to CID. CI's had adverse professional impact for 52% and adverse personal impact for 37% but 48% reported a positive professional impact.

Conclusion(s): CID is important, acceptable and feasible even in a busy trauma centre. By supporting anaesthetists post-CI through a targeted CID program adverse effects of Cis can be mitigated and positive impact achieved.

References:

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55AP01-4

Implementing a well-being curriculum for anesthesiology residents: a pilot program experience in Brazil

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Background and Goal of Study: Medical residency is a period marked by high stress demands, which can negatively impact residents' well-being and also the patient care. This study presents the implementation of a well-being curriculum at a Brazilian teaching hospital designed to reduce stress and promote selfcare both in staff and residents.

Materials and Methods: Launched in April 2022 at PUC-Campinas, Brazil, the Well-being Medical Residency Program (WMRP) involved 52 participants (29 staff and 23 residents). The program included modules on physician wellness, resilience, emotional well-being, financial management, and mindfulness. Data were collected using the Maslach Burnout Inventory (MBI) and a satisfaction questionnaire previous and after WMRP.

Results and Discussion: The MBI scale (44 respondents) indicated high emotional exhaustion (EE) and burnout risk, with 80% of residents and 57.9% of staff at high risk. These findings align with studies highlighting burnout in surgical specialties, including anesthesiology (Afonso et al., 2020). Social events and stress-coping strategies were well-received, with over 90% of participants reporting improvements in well-being. These results support previous research suggesting that wellness activities and team building reduce burnout and enhance resilience (Saadat et al., 2017). Challenges included initial resistance and logistical constraints, particularly related to scheduling and financial limitations, which hindered the full implementation of the program.

Conclusion(s): This pilot program introduced a culture of wellbeing within the anesthesiology residency program, but further research is needed to optimize which are the better interventions and evaluate their long-term effects.

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Acknowledgements: The authors gratitude to all faculty members of the Department of Anesthesiology of Pontifícia Universidade Católica of Campinas (PUC-Campinas)

Pregnancy and parenthood for female intensive care unit (ICU) physicians

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Background and Goal of Study: Pregnancy for female intensivists is particularly challenging due to the high demands and the critical nature of their work environment. They often face unique stressors, including balancing their responsibilities as healthcare providers with their roles as expectant or new mothers. Illnesses among this workforce include sick leave due to work-related and pregnancy-related diseases, with very high absenteeism. The primary objective of this study was to review the available literature on gestational and occupational risks to which pregnant healthcare workers are exposed, causes of absenteeism, and issues related to maternity protection and ICU work.

Materials and Methods: The authors used online databases to identify articles published from 2015 to 2024, using the PRISMA extension for scoping reviews.

Results and Discussion: The study examined 18 peer-reviewed scientific articles addressing pregnancy, work, absenteeism and maternity protection. Most studies used a quantitative approach (12), particularly cohort studies (6). The use of sick or "precautionary" leave emerged in 11 papers as the emergency "solution" to the hospital administration's incapacity to readjust the work environment or reassign to other tasks. Thirteen articles analysed adverse gestational complications (spontaneous abortion, preterm birth, fetal abnormalities and intrauterine growth restriction). Ten articles recommended improving working conditions with social support and a proactive approach to support the working capacity of pregnant women and ensure a healthy and risk-free work environment.

Conclusion(s): This review findings, even if incomplete, report some inferences on pregnancy complications, associated occupational risk factors, significant causes of absenteeism, maternity protection measures and challenges for the careers and professional lives of pregnant workers in the ICU. Support systems, such as flexible work arrangements, access to child care, and mental health resources, are critical to helping these women navigate the complexities of pregnancy and parenthood while continuing to pursue their demanding careers.

55AP01-6

Evolution of female first authors in Anesthesia & Analgesia: a century of progress in anesthesiology

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Background and Goal of Study: The role of women in medicine has evolved significantly over the last century. This study aims to examine the historical participation of women as first authors in Anesthesia & Analgesia, the oldest journal in anesthesiology, and identify trends in their prevalence over the past 100 years. The study focuses on the analysis of the publication data from 1923 to 2023, marking the centennial history of the journal.

Materials and Methods: This observational, longitudinal retrospective study analyzes data from 2329 articles published between 1923 and 2023 in Anesthesia & Analgesia. A sample of articles from each decade was selected, excluding editorials, letters to the editor, and book reviews. The gender of the first author was identified using gender recognition tools and online resources. Statistical analysis was performed to determine trends in the representation of female authors over time.

Results and Discussion: The study revealed a steady increase in the number of female first authors throughout the century. In 1923, the percentage of women as first authors was negligible, but by 2023, it had risen to 34.5%. The 1970s saw a significant increase in female authorship, likely influenced by the feminist movement and initiatives promoting gender equality. However, disparities remain, with women representing only 18% of first authors across all decades studied. The analysis also highlighted the increasing involvement of women in academic leadership roles, correlating with the rise in first authorship. Despite these advancements, the study also noted that a significant gender gap remains, especially in leadership positions in academic anesthesiology.

Conclusion: This study demonstrates the growing presence of women as first authors over the past century, reflecting broader trends in gender equality within the field of anesthesiology. However, further efforts are needed to bridge the gender gap, particularly in academic leadership roles, to ensure a more balanced representation in scientific contributions.

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Actions to improve researcher mental health in anaesthesiology: the importance of Researcher Mental Health Observatory (ReMO)

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Background and Goal of Study: Occupational safety and health community puts particular focus on the improvement of workers' mental health. Work organization and other psychosocial factors has been emphasized by international organizations (WHO, ILO, ICOH), and EC as an emerging topic. Literature data clearly show that majority of academic staff find their job stressful with levels of burnout higher among researchers than in general working population. Among anaesthesiologists and intensivists job stress is common issue related to various workplace factors (e.g., long working hours, working over the weekend, lack of control over time, handling high-risk patients). The urgent need to improve mental health and well-being in academia was highlighted by the Researcher Mental Health Observatory (ReMO) COST Action and ReMO Manifesto.

Materials and Methods: Desk analysis and available online resources as well as ReMO recommendations were used to define a set of actions and expected outcomes towards promotion of mental health and well-being in researchers from anaesthesiol-

Results and Discussion: Workplace mental health and well-being are topics of increased interest in recent years. Health workers are frequently surveyed taking into consideration the strong evidence between determinants and effects of job stress and burnout in this occupational group. On the contrary, knowledge and attitudes about researcher mental health, and activities implemented worldwide to enforce their well-being are still on a basic level. The data obtained show low levels of awareness about this issue in policy makers, employers, and workers. Based on these findings, preventive and coping strategies need to be introduced at community, institutional, and policy level. In setting the activities and measurable outcomes, the scientific community and policy makers have to take into consideration that job stress in health workers is associated with reduced quality of patient care. Characteristics of job tasks and work organization together with the most important job demands (e.g., work overload, work-home interference) and job resources (e.g., professional development, team work) have to shape the efforts for the improvement of researcher mental health in anaesthesiology.

Conclusion(s): National occupational health and safety strategies have to focus on the mental health and well-being of researchers working in anaesthesiology.

Acknowledgements: COST Action CA19117

55AP01-8

Implementation of a "Learning from Excellence" greatix scheme for theatres staff at the Royal Alexandra Hospital, NHS Scotland

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Background and Goal of Study: Excellence in clinical practice is intentional and can be learned from1. To

- 1) increase learning from excellent practice and
- 2) improve workplace morale by formally recognising excellent practice, a reporting system to recognise excellence within the Royal Alexandra Hospital (RAH) Theatres department, named "Greatix"², was launched in February 2024.

Materials and Methods: An online survey of workplace morale was conducted before and 6 months after the launch of the Greatix system among staff working in Theatres (Anaesthetists, Surgeons, Obstetricians, Anaesthetic Nurses and ODPs, Scrub Nurses, Recovery Nurses, Midwives, and Healthcare Support Staff). An online form was created to allow staff to report excellent practice across Theatres. Form submissions were reviewed and Greatix certificates issued to recognised staff members. A 3-monthly Greatix newsletter was circulated, summarising key learning points from the submitted reports.

Results and Discussion: 51 Greatix submissions were received during the first 6 months of implementation. Communication, teamwork, patient care, and conduct during emergencies were highlighted as themes of excellence that could be learned from. 68 participants took the pre-Greatix workplace morale survey, and 40 participants took the survey 6 months into implementation. Consultant and Trainee Anaesthetists constituted the greatest proportion of participants. With 1 representing poor morale and 5 representing excellent morale, the overall median morale improved from 3/5 pre-implementation to 4/5 at 6 months. Among those who felt they were least likely to be valued at work and least likely to receive positive feedback from another staff member (i.e. self-reported ratings $\leq 3/5$ for these survey items), the median morale improved from 3/5 to 3.5/5, and 3/5 to 4/5 respectively following Greatix implementation. Among those who felt they were least likely to be thanked at work (i.e. self-reported rating ≤ 3/5 for this survey item), the median morale rating remained the same at 3/5 before and after Greatix implementation. Conclusion(s): In addition to promotion of learning from excellent practice, there is evidence of improved workplace morale among Theatres staff following Greatix implementation.

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- 1. https://learningfromexcellence.com/.
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- *Both authors contributed equally as first authors.

Ethics

60AP01-2

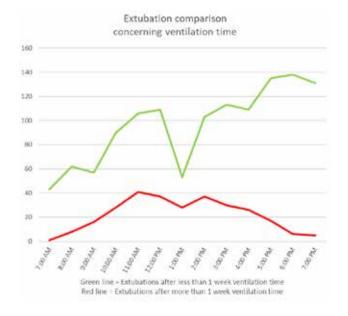
Influence of decision fatigue on length of mechanical ventilation in intensive care medicine – a pilot study

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Background and Goal of Study: Decision fatigue (DF) describes the psychological phenomenon that the quality of decision-making (DM) deteriorates after a long period of DM. Investigations concerning DF in other specialties e.g. emergency medicine and legal sciences have proven a significant impact. A study of parole judge's verdicts in Israel showed favorable outcomes for the defendants whose cases were decided early in the day. The reason given was keeping the defendants locked up poses the "safer option". We postulate that DF can also have an influence on DM in intensive care medicine where many difficult decisions need to be made. The goals of this study are to prove a possible influence of DF on physicians' DM and on ventilation time on the ICU.

Materials and Methods: We are currently conducting a semistructured interview study with 20 ICU physicians to get deeper insights on DF influence on physicians' DM.

We analyzed retrospective patient extubation data over a period of 2 years in preparation for the pilot observational study on the ICU. We will observe ICU physicians over a period of one month and count the number of decisions made, decisions postponed, and interruptions in the DM progress and look for possible confounders and create a time line with daily averages in order to calculate a needed observation time to gather enough data for statistical power.



Results and Discussion: First interview results show physicians tend to postpone difficult decisions after having made many decisions before or towards the end of their shifts and shift series. During night shifts, in emergencies, when alone and when over-

whelmed with many decisions DM is perceived especially hard. Especially residents think of extubations of long-term ventilated patients as a hard decision.

Diagram 1 shows a significant difference between extubation times. Long-term ventilated (n=296) patients are usually extubated before 6 p.m. with numbers declining steadily after 2 p.m.. Short-term ventilated patients (n=1908) are extubated 24/7.

Conclusion(s): DF might have a negative influence on mechanical ventilation and ICU time and therefore increase the risk for VAP and patient outcome.

60AP01-5

Perceptions of artificial intelligence among anaesthesia and intensive care professionals: an ESAIC international survey

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Background and Goal of Study: Artificial intelligence (AI) offers opportunities to enhance diagnostics, treatment, and workflow efficiency. However, successful integration into clinical practice depends on users' acceptance. This international survey among anaesthesia and intensive care professionals explores perceptions of AI-based tools to identify benefits, barriers, and challenges.

Materials and Methods: The survey was distributed to 38,989 members of the European Society of Anaesthesiology and Intensive Care between January and July 2023. We assessed knowledge, experiences, expectations, and concerns regarding Al-based tools, alongside demographic data. Statistical analyses included □² tests, odds ratios, and Spearman rank correlations.

Results and Discussion: A total of 510 respondents completed the survey, primarily from Europe (78%) and Asia (14.5%), and the majority were board-certified anaesthesiologists (86.3%).

Knowledge and Experiences: 86.5% were aware of Al tools, but only 36.8% reported regular encounters. Familiarity was higher among males (90.7% vs. 81.7% in females) and intensive care specialists. 94.5% expressed interest in Al training, particularly younger and less experienced professionals.

Opportunities: 94.7% expressed willingness to use Al tools, citing benefits such as improved decision-making (92.7%), complication anticipation (88.6%), and workload reduction (80.1%). Younger and female respondents were more optimistic about Al's benefits. **Concerns**: Key concerns included lack of explainability (68.4%), over-reliance on Al (80.8%), and medico-legal uncertainties (58.4%). Ethical concerns were more pronounced among females (odds ratio: 1.9; p=0.002). Scepticism was attributed to insufficient validation studies and fears of inaccurate outputs, particularly among experienced clinicians. Although there is strong optimism about Al's potential to enhance patient care, significant

barriers remain, including concerns about reliability, ethics, and regulation. Younger professionals demonstrated greater enthusiasm, while experienced practitioners were more cautious, revealing a generational divide.

Conclusions: This survey shows cautious optimism among anaesthesia and intensive care professionals regarding AI tools. Tailored training, robust validation studies, and clear ethical and legal frameworks are essential for building trust and acceptance. Addressing demographic-specific concerns will further support AI adoption in clinical practice.

Conclusion(s): There was heterogeneity among the answers regarding the care of elderly patients. Evidence-based medicine must be combined with the application of bioethical principles throughout patient care. There are potential forms of bias and unfair discrimination towards elderly patients that must be further investigated and addressed.

60AP01-6

Ageism as a barrier in equitable healthcare provision

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Background and Goal of Study: We recorded and analysed the knowledge, attitudes and practices of healthcare professionals at hospitals in the Thessaloniki, Greece in relation to the care of elderly

patients.

Materials and Methods: A questionnaire was distributed to physicians and nurses at several. Thessaloniki hospitals. It included questions regarding knowledge, attitudes and practices in the care of the elder healthcare receivers. The questions were mainly binary (yes/no) and summarised as percentages. Potential associations were investigated between the individual characteristics of healthcare professionals (specialty, work sector) and the recorded trends.

Results and Discussion: A total of 298 healthcare professionals completed the questionnaire, 49.3% of whom were female, 39.6% were nurses, 50.3% worked in internal medicine departments, 40.7% in surgical departments and the remainder in other sectors. Of all participants, 55.4% defined the elderly patients as those above 80. A selection of questions along with the proportion that replied positively is presented below:

Elderly patients experience less pain	48.3%	
I am aware of the term ageism	41.3%	
I spend more time taking medical history from elderly patients	74.8%	
I am burdened with less responsibility during the treatment of elderly patients	61.7%	
I like caring for elderly patients	55.0%	
I prefer having nothing to do with elderly patients at my job	26.8%	
I treat all patients the same, regardless of age	43.3%	

Compared to the healthcare professionals working in surgical departments, those in the internal medicine departments were more likely to be reluctant in providing care to the elderly patients [adjusted odds ratio (aOR): 24.1, 95% confidence interval (CI): 10.8-53.7] feeling less responsability in treating them (aOR: 8.47, 95% CI: 3.87-18.6). Compared to men, women were more likely to declare that they did not like caring for elderly patients (aOR: 4.44, 95%

Cl: 2.04-9.62) and more likely to consider that the elderly have a negative impact on the economy (aOR: 17.5, 95% Cl: 8.26-37.3).

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