



ASPA 2023

19th ASPA conference & 31st KSPA annual meeting

Equity and Quality in Pediatric Anesthesia

16 (Fri) – 18 (Sun) June, 2023
SC Convention Center, Seoul, Korea



The Korean Society Pediatric Anesthesia



대한소아마취학회

INFORMATION

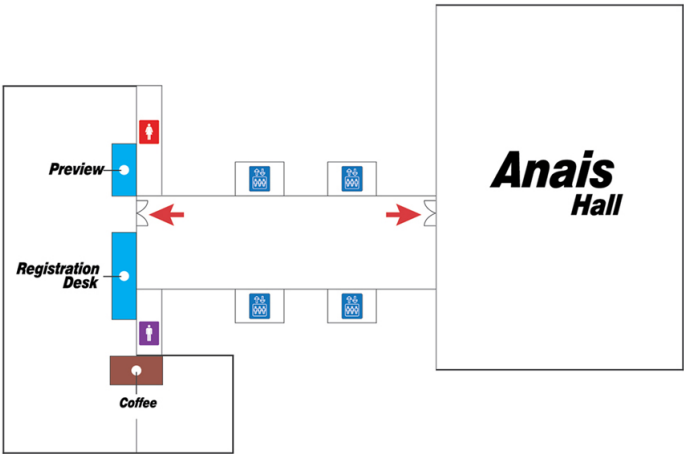


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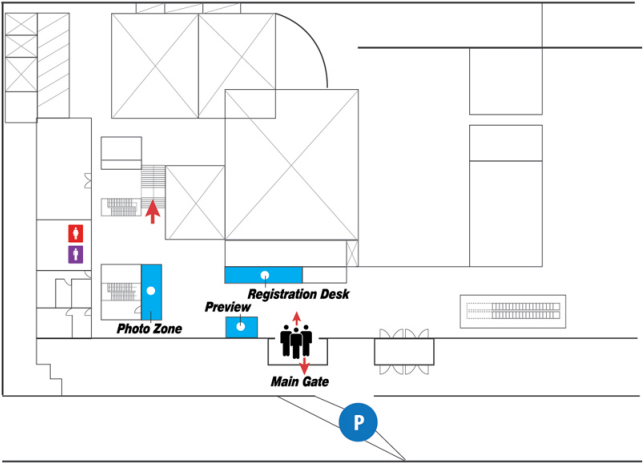
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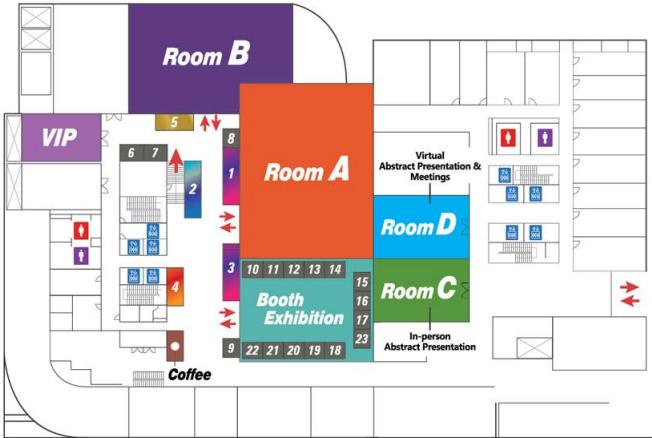
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WELCOME MESSAGE

The Korean Society of Pediatric Anesthesiologists
(KSPA)

Dear Colleagues and Friends,

On behalf of the Organizing Committee, I am honored to host the 19th conference of the Asian Society of Paediatric Anaesthesiologists (ASPA 2023) in conjunction with the 31st Korean Society of Pediatric Anesthesiologists annual meeting in Seoul, South Korea on June 16-18, 2023.

Children are our future. Taking care of children's health is keeping "the value of the future." Pediatric anesthesiologists have a mission to ensure the safety and health of pediatric patients during the perioperative period. ASPA 2023 and its scientific program have been prepared with this in mind.

We have an exciting program at ASPA 2023 that will allow all of you to reflect upon and celebrate our past accomplishments, renew friendships and extend our networks, and jointly explore current and future research directions. We hope you will have a productive and fun-filled time at this special conference. The backdrop of the beautiful and historic city of Seoul will add to the pleasure of the meeting and provide lasting memories beyond medicine. You can expect a fascinating, fruitful, and enjoyable time in Seoul.

Looking forward to welcoming you to Seoul, South Korea for ASPA 2023!

President of Korean Society of Pediatric Anesthesiologists

Jin-Tae Kim

A handwritten signature in black ink, appearing to read 'Jin-Tae Kim' in a cursive style.



WELCOME MESSAGE

The Asian Society of Paediatric Anaesthesiologists
(ASPA)

Dear friends and colleagues

We have now entered a new year, a fresh beginning. With the pandemic mostly under control, I am thankful that we can meet face to face, in Seoul for the 19th ASPA meeting.

People say that "Children's health is our nation's wealth" and health in the early years is important to allow children to thrive and grow into healthy adults.

ASPA is dedicated to fostering safe and high standards of Paediatric Anaesthesia for children in Asia. We hope to achieve this through sharing and supporting each other through research, with development of newer drugs and improved technology enhancing our knowledge of how to monitor our patients in greater detail and depth.

The theme of ASPA 2023 is "Equity and Quality in Paediatric Anaesthesia". We recognize that children are not small adults and Paediatric Anaesthesiologists need to be sharper and have heightened senses when caring for a young child.

I trust that we will be learning plenty from the wonderful programme drawn up by Professor Jin Tae Kim and his team in the organizing committee for ASPA 2023.

I would like to thank everyone for their contributions in making ASPA 2023 a success.

President of Asian Society of Paediatric Anaesthesiologists

Josephine Tan

COMMITTEES

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	Tae-Hun Ahn	Chosun University
	Sungsik Park	Kyungpook National University
	Ah Young Oh	Seoul National University

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President	Josephine Tan	Singapore
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	Duenpen Horatanaruang	Thailand
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	Elsa Verghese	India
	Niki Suneerat	Thailand

Room C

09:00-09:20 Welcome and Introduction (Room A)

09:20-10:50 Abstract Presentation 1 (In-person)

Seokyoung Song (Korea)

In-Kyung Song (Korea)

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|-------|--|-----------------------------|
| AP1-1 | Nasotracheal vs Orotracheal Intubation and Post-Extubation Airway Complications Among Children Undergoing Congenital Heart Surgery | Deniz Sivrioglu (Türkiye) |
| AP1-2 | Anesthesia Management of Cleft Lip Repair, Complicated with Gordon Syndrome and its Challenges | Rina Cordeiro (India) |
| AP1-3 | Pediatric Airway Management in Undiagnosed Congenital Subglottic Stenosis Undergoing Congenital Cardiac Surgery | Virtual |
| AP1-4 | Risk Factors for Delayed Extubation After Pediatric Perineal Anoplasty: A Retrospective Study | Qianqian Zhang (China) |
| AP1-5 | Anaesthetic Management of a Case of Fraser Syndrome with Group III Cleft Lip-Palate with Laryngomalacia and Subglottic Stenosis | Sumit Kumar Singh (India) |
| AP1-6 | Developing Interdiscipline Communication to Enhanced Patient Safety in Pediatric Difficult Airway Management | Raihanita Zahra (Indonesia) |
| AP1-7 | Guidewire Use for Nasopharyngeal Passage in Pediatric Nasotracheal Intubation: A Randomized Prospective Study | Asim Esen (Türkiye) |
| AP1-8 | Case Reports: Newborns with Tracheal Agenesis | Hye Su Kim (Korea) |

10:50-11:00 Coffee Break

11:00-12:30 Abstract Presentation 2 (In-person)

Won-Jung Shin (Korea)

Young Eun Jang (Korea)

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|-------|--|----------------------------|
| AP2-1 | Comparison of Morphine and Fentanyl Induced Cardioprotection Against Ischemia-Reperfusion Injury In Acyanotic Children Undergoing Open Heart Surgery: A Preliminary Report | Withdrawn |
| AP2-2 | Report of the First Successful Senning Procedure from Nepal | Santosh S Parajuli (Nepal) |
| AP2-3 | Evaluation of an Enhanced Recovery Protocol in Pediatric Cardiac Surgical Patients in a Single Tertiary Care Unit | Esha Nilekani (India) |

DAY 2 17 June 2023 (Sat)

SC Convention International Conference Hall (B1F)

AP2-4	Multisystem Inflammatory Syndrome in Children: An Emerging Clinical Challenge for Pediatric Cardiac Surgery in the COVID-19 Era: Case Series	Withdrawn
AP2-5	Anesthetic Management of Patent Ductus Arteriosus Ligation by Video-Assisted Thoracoscopy in Premature Babies Low-Birth Weight<2kg: A Retrospective Observational Study	Qinghua Huang (China)
AP2-6	Anesthetic Experience of Repair of Esophageal Atresia in a Child with BPFM, Esophageal Atresia, and Full-length Tracheal Stenosis	Takashi Fujiwara (Japan)
AP2-7	Anesthetic Management in a Child with Single Ventricle Heart Undergoing Drainage of Brain Abscesses	Pryl Kim Ngoslab (Philippines)
AP2-8	Anesthetic Management in a Child with Late Onset Congenital Diaphragmatic Hernia Undergoing Repair	Anna Loraine Ostrea (Philippines)

12:30-14:00 Luncheon Symposium (Room A)

Dong Woo Han (Korea)

EEG Guided Anesthesia in Young Children (Virtual)

Ian Yuan (USA)

14:00-15:30 Abstract Presentation 3 (In-person)

Eugene Kim (Korea)

Young Sung Kim (Korea)

AP3-1	Perioperative Hypothermia in Pediatric Population in University Malaysia Medical Centre	Noor Ifitah/AR (Malaysia)
AP3-2	Atelectasis and Re-expansion Pulmonary Edema in Patient Undergoing Atrial Septal Defect (ASD) Closure with Minimally Invasive Cardiac Surgery	Stephanus AP/Kaligis (Indonesia)
AP3-3	Activation of Rapid Response Team in Pediatric Ward: A Cross Sectional Study in Indonesia's Top Referral Hospital	Hilferia Simbolon (Indonesia)
AP3-4	Towards a Zero Postoperative Vomiting (POV) in Children after Tonsillectomy	Joseph Tobias (Australia)
AP3-5	Anesthetic Management in a Patient with Nonketotic Hyperglycinemia	Withdrawn
AP3-6	Distraction Techniques for Post-operative Paediatric Patients in Post Anaesthesia Care Unit (PACU): a Randomized Control Trial	Virtual
AP3-7	Perioperative Respiratory Adverse Events Following General Anesthesia Among Pediatric Patients after COVID-19	Jung-Bin Park (Korea)

SC Convention International Conference Hall (B1F)

AP3-8 Platelet-lymphocyte Ratio and Neutrophil-lymphocyte Ratio for Predicting Respiratory Complications after Congenital Heart Surgery Ji-Woong Yang (Korea)

15:30-15:50 Coffee Break

15:50-17:20 Abstract Presentation 4 (In-person)

Sang Hun Kim (Korea)

Hyun Kang (Korea)

AP4-1	Transversus Abdominis Plane Block after Sub Arachnoid Block Reduces Postoperative Pain Intensity and Analgesic Consumption in Elective Lower Abdominal Surgeries in Pediatric Patients-Case Series	Gunjan Singh (India)
AP4-2	Postoperative Sedation and Analgesia in Pediatric Cardiac Surgery	Virtual
AP4-3	Erector Spinae Plane Block with Ropivacaine 0.2% in Children-A Case Series, Single Center Experience in Tertiary Pediatric Center in Malaysia	Noor Hasimah (Malaysia)
AP4-4	ESP Block for Anesthesia in a Pediatric Patient Who Underwent Diagnostic Laparoscopy after Foreign Body Injury	Kubra Ozturk (Türkiye)
AP4-5	Epidural Analgesia in Major Paediatric Oncosurgeries: A Review of Safety Profile and Practices	Withdrawn
AP4-6	Analgesic Efficacy and Safety of Ultrasound-guided Erector Spinae Plane Block in Pediatric Patients Undergoing Surgery: A Systematic Review and Meta-Analysis of Randomized Controlled Trials	Seokwoo Jeong (Korea)
AP4-7	Prediction of Effect and Complications of PCA in Children Undergoing Urologic Surgery	Ho-Jae Nam (Korea)

17:20 Closing Remarks (Room A)

DAY 2 17 June 2023 (Sat)

SC Convention International Conference Hall (B1F)

Room D

09:00-09:20 Welcome and Introduction (Room A)

09:20-10:50 Abstract Presentation 1 (Virtual)

Sooyoung Cho (Korea)

Hee Young Kim (Korea)

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|------|---|------------------------------|
| V1-1 | "Know It to Deal with It"- Neonatal Airway Management with a Large Sincipital Encephalocele | Pranita Mandal (India) |
| V1-2 | Nasotracheal Intubation Guided by the Esophageal Temperature Probe in Children | Withdrawn |
| V1-3 | Risk Factors for Failed First Attempt of Intubation in Pediatric Patients: Preliminary Results of a Prospective Observational Study | Faiza Grati (Tunisia) |
| V1-4 | Management of a Rapidly Growing Sublingual Congenital Ranula: A Case Report | Anouar Jarraya (Tunisia) |
| V1-5 | An Innovative Technique to Deflate and Reinflate the Tracheostomy Tube to Facilitate Ventilation During Tracheal Resection and Reconstruction Surgeries | Nesara N (India) |
| V1-6 | Airway Management of a Congenital Teratoma with a Cleft Palate: An Original Case Report | Kammoun Manel (Tunisia) |
| V1-7 | Airway Management of Congenital Pulmonary Airway Malformation Resection in an Infant in Resource limited Setting: A Case Report | Shephali (India) |
| V1-8 | Pediatric Airway Management in Undiagnosed Congenital Subglottic Stenosis Undergoing Congenital Cardiac Surgery | Demet Altun Bingöl (Türkiye) |

10:50-11:00 Coffee Break

11:00-12:30 Abstract Presentation 2 (Virtual)

Ji-Hyun Lee (Korea)

Ye Yun Phang (Malaysia)

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|------|--|-----------------------------|
| V2-1 | Anesthesia Management of Left Pulmonary Artery Sling: LPA Reimplantation Without Cardiopulmonary Bypass | Anshoril Arifin (Indonesia) |
| V2-2 | Fast Track Extubation in Severe Scoliosis with Cor Pulmonale: The Role of Non Invasive Ventilation | Lakshmipraba M (India) |
| V2-3 | A Single Institute Retrospective Audit of the Anaesthesia Management in Children Undergoing Epilepsy Surgery | Vedhika Shanker (India) |

SC Convention International Conference Hall (B1F)

V2-4	Anaesthesia Management in a Rare Skeletal Dysplasia-Desbuquois Syndrome: A Case Report	Vedhika Shanker (India)
V2-5	Perioperative Management of a Preterm Infant for Subgaleo-ventricular Shunt	Archana Raichurkar (India)
V2-6	Ultrasound Assessment of Cricothyroid Membrane (CTM) in Children with Respect to Front of Neck Access – An Observational Study	Sandeep Viyyuri (India)
V2-7	Anaesthetic Implications and Considerations in Children with Permanent Pacemaker for Non-Cardiac Surgery: A Report of 2 Cases	Ismail@Mamat NN (Malaysia)
V2-8	Spinal Anaesthesia: The choice in Preterm Neonates with Chronic Lung Disease	Pavitra G C S (India)

12:30-14:00 ASPA 16th Annual General Meeting (Hybrid)

DAY 3 18 June 2023 (Sun)

SC Convention International Conference Hall (B1F)

Room C

08:30-10:00 Abstract Presentation 5 (In-person)

Hyo-Jin Byon (Korea)

Hye Mi Lee (Korea)

AP5-1	Predictors of Sedation Failure with Initial dose of Intranasal Dexmedetomidine and Oral Midazolam for Pediatric Procedural Sedation	Withdrawn
AP5-2	Retrospective Study on an Inhalational Sevoflurane Technique for Ex-preterm Infants Undergoing Elective Inguinal Hernia Surgery	Esha Nilekani (India)
AP5-3	The Use of Dexmedetomidine for Pediatric Patients with Conjoined Twins Undergoing Computed Tomography Thoracoabdominal	Priscilla Tulong (Indonesia)
AP5-4	Stirp Sugar Midazolam! New Formulation of Midazolam (Midazolam Loaded Oral Film Via Electrospinning)(Preliminary Study)	Şükran Geze Saatçi (Türkiye)
AP5-5	Sedation in a Child with Difficult Airway for Magnetic Resonance Imaging (MRI)	Nirawanti (Malaysia)
AP5-6	A Balancing Act of Survival: A Case Report on the Anesthetic Management of an Ex Utero Intrapartum Procedure	Virtual
AP5-7	Effect of High-flow Nasal and Buccal Oxygenation on Safe Apnea Time in Children with Open Mouth	Chan-Ho Hong (Korea)
AP5-8	Near-infrared Spectroscopy Monitoring Failure in a Patient with Chronic Hypoxemia Undergoing Total Correction of Tetralogy of Fallot	Hwa-Young Jang (Korea)

10:00-10:50 Coffee Break

10:50-12:20 Abstract Presentation 6 (In-person)

Eun-Hee Kim (Korea)

Yong-Hee Park (Korea)

AP6-1	Implementation of "Goal Directed Bleeding Management" at Shahid Ghalib National Heart Center	Virtual
AP6-2	The Outcomes of PICC Insertion in Pediatric Patient at Siriraj Hospital	Niracha (Thailand)
AP6-3	Routine to Risk-based: A Pediatric Hemophilia B Case Report and the Adoption of Targeted Preoperative Blood Testing Practices with Questionnaires	Aya Sueda (Japan)

SC Convention International Conference Hall (B1F)

AP6-4	Use of Continuous Positive Airway Pressure During Sevoflurane Inhalational Induction does not Result in Faster Induction but Increases Sevoflurane Consumption	Akhil Kant Singh (India)
AP6-5	Effect of Single-dose Intravenous Lignocaine versus Fentanyl on Neuromuscular Recovery Time after General Anesthesia in Elective Pediatric Surgery: A Randomized Controlled Pilot Study	Mridul Dhar (India)
AP6-6	The Perioperative Coagulation Profile in Pediatric Patients Undergoing Liver Transplant Surgery	Komang Ayu Ferdiana (Indonesia)
AP6-7	Experiences of Our Pediatric Anesthesia After Devastating Earthquakes in Turkey	Melike Demir (Türkiye)

12:20-13:30 Luncheon Symposium (Room A)

Ah Young Oh (Korea)

Sugammadex: Game Changer of NM Reversal

Nicola Disma (Italy)

15:10-15:30 Coffee Break

17:00 ASPA 2024 Promotion
Closing and Farewell (Room A)

DAY 3 18 June 2023 (Sun)

SC Convention International Conference Hall (B1F)

Room D		
08:30-10:00 Abstract Presentation 3 (Virtual)		Jin Hee Ahn (Korea) Sung-Ae Cho (Korea)
V3-1	Bispectral Index Relation with Delirium in Post Cardiac Surgery Patients	Abdul Fatah Abro (Lithuania)
V3-2	The Impact of Oral Fluid Intake 1 Hour Prior to Surgery on Anxiety Levels and Gastric Volume in Pediatric Patients	Zehra Hatipoglu (Türkiye)
V3-3	Improvement of Broviac Catheter-related Outcomes after the Implementation of a Quality Management System: A Before-and-After Prospective Observational Study	Faiza Grati (Tunisia)
V3-4	Predictors of Perioperative Respiratory Adverse Events Among Children with a Cold Undergoing Pediatric Ambulatory Ilio-inguinal Surgery: Prospective Observational Research	Kammoun Manel (Tunisia)
V3-5	Intra Operative Fat Embolism in A Child with Osteogenesis Imperfecta-Double Whammy!	Snehal Tare (India)
V3-6	Risk Factors for Hickman-broviac Catheter Complications: The Experience of a Tunisian Hospital	Kammoun Manel (Tunisia)
V3-7	Complications and Risk Factors of Percutaneous Subclavian Vein Catheters in Pediatric Patients: Enhancing the Outcomes of a University Hospital in a Developing Country	Jarraya Anouar (Tunisia)
V3-8	Implementation of "Goal Directed Bleeding Management" at Shahid Gangalal National Heart Center	Ashish G. Amatya (Nepal)
10:00-10:50 Coffee Break		
10:50-12:20 Abstract Presentation 4 (Virtual)		Eun-Young Joo (Korea) Woo Suk Chung (Korea)
V4-1	The Utility of Enhanced Recovery After Surgery (ERAS) Protocols in Adolescent Scoliosis Surgery: A Systematic Review and Meta Analysis	Bharat Yalla (India)
V4-2	Comparison of Ultrasound Guided Thoracic Paravertebral Block Versus Serratus Anterior Plane Block in Children Undergoing Thoracic Surgery: A Prospective Observational Study	Emre Sertaç Bingöl (Türkiye)

SC Convention International Conference Hall (B1F)

V4-3	Procedural Sedation and Anaesthetic Technique in Paediatric Patients with Anterior Mediastinal Mass in a Quaternary Centre-Our 3 Years of Experience	Rowena Lee (Hong Kong)
V4-4	Distraction Techniques for Post-operative Paediatric Patients in Post Anaesthesia Care Unit (PACU) a Randomized Control Trial	Shemila Abbasi (Pakistan)
V4-5	Perioperative Anaesthetic Management of Button Battery Ingestion: A Case Report	Won Jee Lee (Malaysia)
V4-6	Computed Tomographic(CT) Scan Measurements of Anatomical Landmark for Suprazygomatic Maxillary Nerve Block in Children	Sushma Konduri (India)
V4-7	A Balancing Act of Survival: A Case Report on the Anesthetic Management of an Ex Utero Intrapartum Procedure	Alexandra Lao (Philippines)
V4-8	Postoperative Sedation and Analgesia in Pediatric Cardiac Surgery	Elmira Satvaldieva (Uzbekistan)

12:20-13:30 Luncheon Symposium (Room A)

Ah Young Oh (Korea)

Sugammadex: Game Changer of NM Reversal

Nicola Disma (Italy)

15:10-15:30 Coffee Break

17:00 ASPA 2024 Promotion
Closing and Farewell (Room A)



Abstract Presentation



Day 2_Room C

Abstract Presentation 1 (In-person)

Chair(s): Seokyoung Song (Korea)
In-Kyung Song (Korea)

Nasotracheal vs. Orotracheal Intubation and Post-Extubation Airway Complications Among Children Undergoing Congenital Heart Surgery

Deniz Sivrioğlu¹, Nükhet Akovalı¹, Murat Özkan², Pınar Zeyneloğlu¹

¹Department of Anesthesiology, Başkent University Faculty of Medicine Ankara, Turkey

²Department of Cardiovascular Surgery, Başkent University Faculty of Medicine, Ankara, Turkey

Background: In cardiac surgery, oral intubation is more common due to its ease and lower pain. However, it may be associated with oral aversion in children (1). Moreover, nasal intubation has several benefits; including less trauma, less postoperative sedation, and possibly lower post-extubation airway obstruction rate. There is additional concern that nasal intubation carries an increased risk of epistaxis and sinusitis (2,3). In children undergoing cardiac surgery, extubation failure has been associated with increased morbidity and mortality (4). Studies involving post-extubation airway complications of nasal vs oral intubation in children undergoing congenital heart surgery are not available. The study aims to compare post-extubation airway complications in children undergoing congenital heart surgery after nasal and oral intubation.

Methods: A retrospective observational study was conducted on pediatric cardiac surgery patients <2 years from April 2022 to March 2023. Patients with preoperative endotracheal tube, tracheostomy, known airway anomalies, or those who died before extubation attempt were excluded. Perioperative data were collected from medical records. Standard protocol was followed to perform nasal and oral intubation. Extubation failure was defined as reintubation within 72 hours of the first planned extubation. The primary outcome was the extubation failure rate and secondary outcomes were duration of postoperative intubation, post-extubation airway obstruction, skin trauma, postoperative arrhythmia, bleeding, pneumothorax, cardiac arrest, infection, oral aversion, duration of ICU stay, hospital length of stay, and mortality.

Results: Among 122 children who underwent congenital heart surgery, 107 patients were analyzed and of those, 54 were intubated nasally and 53 orally. The extubation failure rate was similar (22.2 vs 20.8%, respectively, $p = 1.00$). Duration of postoperative intubation was significantly longer among nasally intubated children (39.5 vs 38.7 hours, $p = 0.02$). Nasally intubated patients had a statistically significant lower rate of oral aversion (24.1 vs 47.2%; $p = 0.02$), but other secondary outcomes were similar in both patient group.

Discussion: In our cohort, the postoperative extubation failure rates were similar after nasal and oral intubation. No significant difference was found in post-extubation airway complications between nasal and oral intubation. Nasal intubation may be a preferable option.

AP1-2

Anesthesia Management of Cleft Lip Repair, Complicated with Gordon Syndrome and Its Challenges

Rina Cordeiro¹, Priyanka Phadte²

¹Department of Anesthesiology, North Goa District Hospital, Mapusa, Goa, India

²Department of Anesthesiology, Goa Medical College and Hospital, Bambolim, Goa, India

Background: Cleft lip with cleft palate is an anticipated difficult airway in children, management of which can be demanding if associated with a syndrome. Our patient had Gordon syndrome, also known as distal arthrogryposis type 3 (DA3) is an autosomal dominant disorder, that mainly affects the movement in the joint of the upper and lower limb, caused by genetic changes in PIEZO 2 gene on chromosome 18p11. Other abnormalities, may also be present and include camptodactyly, club feet, congenital hip dislocation (CDH), cleft palate, bifid uvula, pterygium colli, scoliosis. The intravenous access as well as intubation can be exigent. The anesthetist needs to be well equipped for a difficult airway.

Case Report: We report a case of male infant, with deformity of lips, palate and face. He was posted for cheiloplasty (lip repair). He had complete bilateral cleft lip and palate, buphthalmos with megalocornea, prolapsed iris (left eye), ectropion, coloboma as well as, congenital hip dislocation, deformity at elbow and flexion at wrist joint. He had short neck, retrognathia as well as distortion of cervical spine. We managed the airway as per DAS/APA guidelines for 'Anticipated Difficult Airway in pediatrics' using inhalational technique for intubation, balanced general anesthesia for with infra-orbital block. Intubation and surgery were uneventful.

Discussion: Patients with Gordon syndrome may undergo at least 1 surgical procedure for the arthrogryptic deformities. These underlying abnormalities are challenging to the anesthetists, and causes difficult intravenous access and anticipated difficult intubation.

Anticipated difficult airway is due to facial and neck involvement which may include micrognathia, cleft lip and palate, retro-glossoptosis, limited mouth opening, and limited neck extension, requiring skills, preparedness and advanced airway equipment.

Conclusions: Airway management of children with cleft lip in Gordon syndrome is an arduous task for an Anesthetist, it needs expertise, accessibility of modern airway equipment and knowledge of difficult airway guidelines.



AP1-3

Pediatric Airway Management in Undiagnosed Congenital Subglottic Stenosis Undergoing Congenital Cardiac Surgery

Virtual

Risk Factors for Delayed Extubation after Pediatric Perineal Anoplasty: A Retrospective Study

Qianqian Zhang¹, Jing XU², Qinghua Huang³, Tianqing Gong⁴, Yu Cui^{1,4}

Department of Anesthesiology, The Affiliated Hospital, School of Medicine,
UESTC Chengdu Women's & Children's Central Hospital

Anorectal malformation are common congenital problems occurring in 1 in 5,000 births and have a spectrum of anatomical presentations, requiring individualized surgical treatments for normal growth. Delayed extubation or reintubation may result in a longer intensive care unit (ICU) stay and hospital stay, increased mortality, prolonged duration of mechanical ventilation, increased tracheostomy rate, and higher hospital costs. It is necessary and beneficial to postoperative extubation for infants. The successful identification of factors associated with prolonged time to extubation could assist clinicians in identifying patient at risk who may benefit from individualised approaches and allow schedulers to anticipate operating room turnover times more accurately.

we performed a retrospective study of Neonates and infants (\leq one years old) who underwent anorectal malformation surgery between June 2018 and June 2022. The principal goal of this study was to investigate the incidence of delayed extubation in pediatric anorectal malformation surgery. The secondary goals was to identify the factors associated with delayed extubation in these patients. The variables associated with delayed extubation ($P \leq 0.2$) by univariate analysis were included in the multivariate logistic regression for identification of predictive risk factors. Adjusted odds ratio and 95% CI were reported.

We collected data describing 123 patients who had anorectal malformations from 2019 to 2022. It shown that 74(60.2%) in the normal intubation group and 49(39.8%) in the longer extubation.

In the final model, anesthesia methods and age was independently associated with delayed extubation ($P < 0.05$). None of others factors were found significant in the multivariate logistic regression. There are no patient with post operative ICU, in-hospital mortality, readmitted within 30-day or accepted an unplanned reoperation.

Theoretically, the perioperative management for neonates and infants is challenged from many aspects, not only regarding complicated and rapidly deteriorating conditions, but also with comprehensive anesthesia managements. Early extubation may be beneficial in reducing postoperative mortality and morbidity. Therefore, it is very important to achieve early extubation clinically of neonates and infants. Our study also showed that age ≤ 1 month old was a predictor for delayed extubation after congenital anorectal surgery.

AP1-5

Anaesthetic Management of a Case of Fraser Syndrome with Group III Cleft Lip-Palate with Laryngomalacia and Subglottic Stenosis

Sumit Kumar Singh

Department of Anaesthesiology, Pain Medicine and Critical Care, All India Institute Of Medical Sciences, New Delhi, India

Background: Fraser syndrome is a rare autosomal genetic disorder with an incidence of less than 0.043 per 1000 live births. It is characterised by cryptophthalmos, syndactyly, genital malformations, renal anomalies, musculoskeletal anomalies and mental retardation. We report a case of Fraser syndrome with group III cleft lip-palate scheduled for cleft lip repair.

Case Description: A one year nine month old female child presented to the plastic surgery department of the hospital with group III cleft lip palate since birth. The child had normal birth, perinatal and developmental history. She was diagnosed to have Fraser syndrome at birth. On examination, she had cryptophthalmos of both eye, depressed nasal bridge, low set ears, group III cleft lip-palate and syndactyle of all four limbs. On airway examination mouth opening was adequate, modified mallampati grade I, neck movements were adequate and teeth were absent. Lab investigations were within normal limit. Electrocardiogram and 2D echo showed normal study. An ultrasound while abdomen revealed single functioning kidney. FOL revealed type I and II laryngomalacia with grade I subglottic stenosis. In the operation theatre, difficult airway cart was kept ready and ENT backup team was kept standby for emergency surgical airway. ASA standard monitors were attached and a 24G IV cannula was secured on rt foot. Anaesthesia was induced with 50% oxygen and 50% sevoflurane followed by videolaryngoscope guided intubation of trachea. After failing to intubate with size 3 cuffed and uncuffed flexometallic tube, trachea was intubated with size 2.5 uncuffed pvc tube. Once the tube position was confirmed by capnography, IV fentanyl, propofol and atracurium was given. Under all aseptic precaution, b/l infraorbital nerve block was given with 1 ml of 0.25% bupivacaine on each side. The surgery was completed uneventfully and was shifted to PACU. The perioperative course was uneventful.

Discussion: Mohan et al stated that facial anomalies can make mask ventilation, laryngoscopy and laryngeal mask airway insertion difficult. They suggested that awake Fiberoptic bronchoscopy or direct laryngoscopy with aid of gum elastic bougie is a possible option. Use of videolaryngoscope can provide a better vision and assistance for airway management. Inhalational induction with preserved spontaneous ventilation followed by check laryngoscopy can give a good safety margin in case of laryngeal abnormalities, as we did in our case.



Figure 1: Our patient post intubation



Figure 2- Our patient at the preanesthetic checkup

AP1-6

Developing Interdiscipline Communication to Enhanced Patient Safety in Pediatric Difficult Airway Management


Raihanita Zahra

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Background: Difficult airway management in children resulting in increased morbidity and mortality, is considered the unique problems of children. Even paediatric anaesthesiologists and trained emergency paediatricians sometimes have difficulties managing airways in paediatric patients, resulting in catastrophic event. Cognitive biases and mental processing shortcuts, also known as heuristics, have been demonstrated as leading errors in clinical decisions. Lack of communication between team was found as pitfalls due to authority bias.

Case Description: We experienced the case of an 8 y.o. boy with mandible tumour having cardiac arrest after failure of airway management before planned tracheostomy, all the team who was involved had a discussion after and analysed the problems related. In the process we found that there is ineffective communication and inappropriate plan for airway management. One of the recommendations is to form a difficult pediatric airway team consisting of experts such as pediatric anesthesiologist, pediatric emergency, and pediatric ENT surgeons to manage similar cases. We need top management support to fulfill the equipment, now we are still developing training and education for the staff to enhance their skill in difficult paediatric airway management. We start by planning interdisciplinary communication and make preformulated airway plan for each case before the patient is sent to the operating theatre. As a result, there is decreased number of patients experiencing adverse event during the surgery.

Discussion: Communication is required between experienced anaesthesiologists, pediatrician, and, ENT surgeons, to devise a plan for airway management; using a standardized checklist during a time out could result in a favourable outcome based on patient safety when facing a child with a difficult airway. These actions may also improve the level of care provided for the next surgeries, since effective communication has been built and every team member has been given a specific task according to their area of expertise. The number of paediatric airway complications, morbidity, and mortality also can be decreased.



----- Pediatric Airway Response Team Form -----

IDENTIFICATION

Time Activation : _____

Time Response : _____

Consultants Response : _____

POTENTIAL AIRWAY PROBLEMS

☐ Difficult to ventilate

☐ Difficult to intubate

☐ Difficult to Supraglottic Airway

☐ Difficult to Tracheostomy

AIRWAY TEAM

☐ Pediatricians

☐ Anesthesiologists

☐ ENTs

☐ Emergency Physicians

☐ Nurses

☐ Technicians

PREFORMULATED AIRWAY PLAN

CONSULTANT BACK UP

EQUIPMENTS

DRUGS

☐ Fentanyl

☐ Remifentanyl

☐ Propofol

☐ Dexmedetomidine

Emergency Drugs

☐ Sulfas Atropin

☐ Ketamine

☐ Midazolam

☐ Rocuronium

☐ Atracurium

☐ Epinephrine

BASIC AIRWAY EQUIPMENTS

☐ OPA/NPA

☐ SGA

☐ Face Mask

☐ ETT

☐ T-Piece/BVM

☐ Connectors

ADVANCED AIRWAY EQUIPMENTS

☐ Video Laryngoscope

☐ FOB

☐ Gum Elastic Boogie

☐ Bonfills

☐ Front-of-neck Airways Equipments

ADDITIONAL EQUIPMENTS

☐ Oxygen Source

☐ Suction

☐ Airway Surgical Equipments

AP1-7

Guidewire Use for Nasopharyngeal Passage in Pediatric Nasotracheal Intubation: A Randomized Prospective Study

Asim Esen, NıGar Kangarli, Ayda Türköz

Department of Anesthesiology and Intensive Care, Bezmialem Vakif University, Turkey

Background: Nasotracheal intubation (NTI) is a frequently used airway management method in pedodontic dental treatments performed under general anesthesia. However, nasopharyngeal trauma and associated bleeding are common during conventional NTI. In this study, we aimed to examine the effect of angling the end of the endotracheal tube (ETT) by placing a guide wire inside the ETT on nasopharyngeal bleeding.

Methods: 90 patients aged 2-12 years were included in the study and were divided into two groups. In the control group (Group C), NTI was performed in the conventional way, that is, by advancing the ETT directly through the nose. In the study group (Group S), before intubation, a guide wire was inserted into the ETT and an angle of 100-120 degrees (hockey stick shape) was given 2.5-3 cm proximal from the distal end of the ETT. The ETT was inserted into the nose perpendicular to the face. After the angled part of the ETT passed through the nostrils, the ETT was directed to caudal with a movement in accordance with the angle given to the tip of the ETT. In the meantime, the ETT was moved as a whole and aimed to prevent the ETT tip from contacting the posterior wall of the nasopharynx. When the ETT tip reached the oropharynx, the guide wire was removed and the rest of the intubation was completed as in the conventional method.

Results: There was no difference between the groups in terms of demographic data, ASA scores, nostril used, duration of surgery and anesthesia. Bleeding control was performed at the 1st and 5th minutes of intubation by an anesthetist who did not know the group the patient was in. Bleeding; no bleeding, mild bleeding (blood on the tube surface), and severe bleeding (blood pooling around the tube in the oropharynx) were evaluated in three categories. In all three categories, the study group was better than the control group (1st minute: no bleeding S: 84.4%, C: 46.7%; mild bleeding S: 15.6%, C: 31.1%; severe bleeding S: 0.0%, C: 22.2%. 5th minute: No bleeding S: 82.2%, C: 28.9%, mild bleeding S: 15.6, C: 40.0, severe bleeding S: 2.2, C: 31.1. 1st min and 5th min $p < 0.001$)

Discussion: Although, this method is not expected to prevent trauma and bleeding in the nasal passage, according to the results of our study, performing NTI by passing through the nasopharyngeal passage with an ETT in which a guide wire was inserted, caused significantly less nasopharyngeal bleeding compared to the conventional method.



AP1-8

Case Reports: Newborns with Tracheal Agenesis

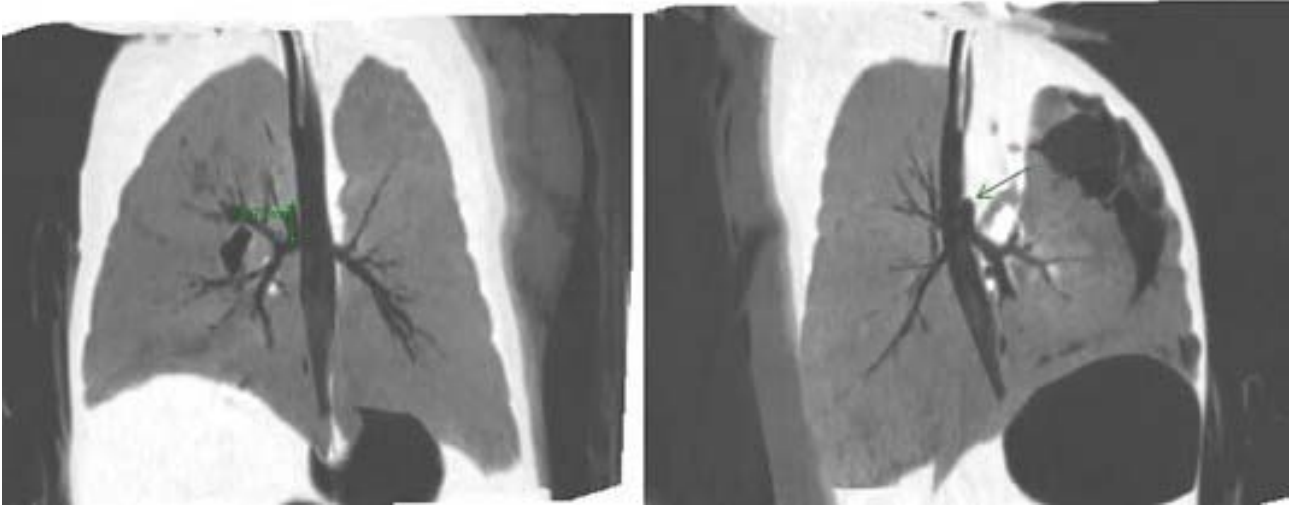
Hye Su Kim, Jun Hyug Choi, Young-Eun Joe, Jeong-Rim Lee

Department of Anesthesiology and Pain Medicine, Anesthesia and Pain Research Institute,
Yonsei University College of Medicine, Seoul, Republic of Korea

Background: Tracheal agenesis (TA) is a rare congenital anomaly characterized by the absence or interruption of the trachea that presents challenges in airway management for newborns. Newborns with tracheal agenesis show a lack of crying, ventilation difficulties, and difficulty with endotracheal intubation. It is crucial to secure an airway for patients suspected of having TA.

Case Description: The patient was delivered by cesarean section at 39+1 weeks of gestation due to fetal bradycardia. The patient weighed 2830gm and Apgar score was 3-3-4. The patient did not cry immediately after birth, appeared cyanosed, and developed bradycardia with a heart rate below 100 beats per minute (bpm). Positive pressure ventilation was administered, but the oxygen saturation remained lower than 50% and the heart rate was 70-80. The pediatrician attempted to intubate three times, but failed. The otolaryngologist attempted a tracheostomy, but the trachea was not visible. Due to suspicion of tracheal agenesis, an endotracheal tube was inserted into the esophagus. After oxygen saturation and heart rate was recovered, the patient was transferred to the neonatal intensive care unit (NICU). A computed tomography scan confirmed the diagnosis of type 2 tracheal agenesis. On the second day of life, the patient underwent a loop colostomy to correct imperforate anus. Sevoflurane, dexmedetomidine, and sufental was used to achieve adequate anesthetic depth and hemodynamic stability. A caudal block was performed before the surgery to provide postoperative analgesia. During the surgery, no neuromuscular blockade was used to maintain self-respiration. The patient was transferred to the NICU without complications. A gastrostomy and esophageal banding were scheduled for the sixth day of life, but the patient expired on the fourth day of life due to aggravation of hypoxia and respiratory acidosis.

Discussion: Unexpected TA can present challenges in airway management for newborns. Early suspicion and securing the airway immediately after birth are crucial for patients suspected of having TA. Maintaining an airway during anesthesia is crucial, as the esophagus used as a pseudo-trachea can easily collapse and minimal movement of the endotracheal tube can occlude the tracheo-esophageal fistula. Anesthesiologists should be familiar with the overall pathophysiology of tracheal agenesis to effectively manage emergencies.





Day 2_Room C

Abstract Presentation 2 (In-person)

Chair(s): Won-Jung Shin (Korea)
Young Eun Jang (Korea)

AP2-1

**Comparison of Morphine and Fentanyl Induced Cardioprotection
Against Ischemia-Reperfusion Injury In Acyanotic Children
Undergoing Open Heart Surgery: A Preliminary Report**

Withdrawn

AP2-2

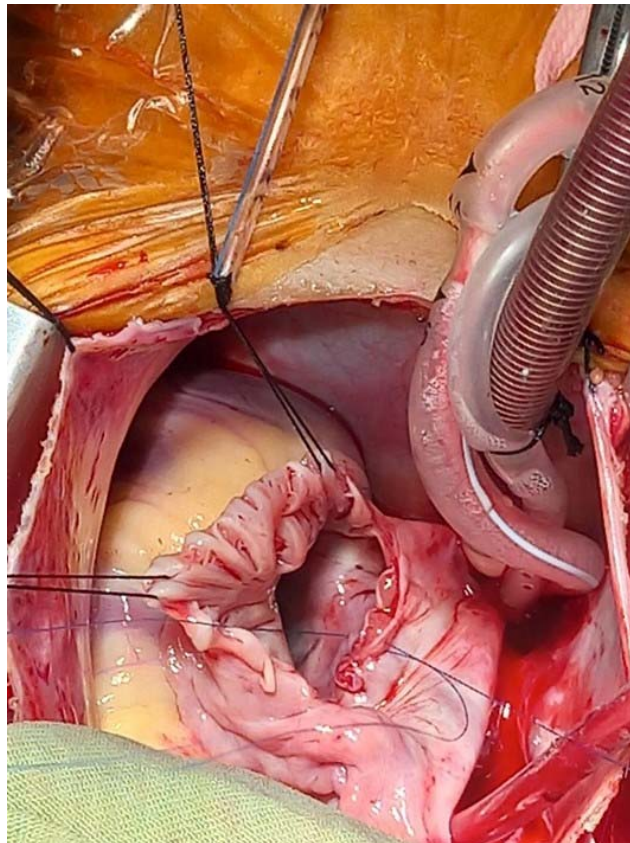
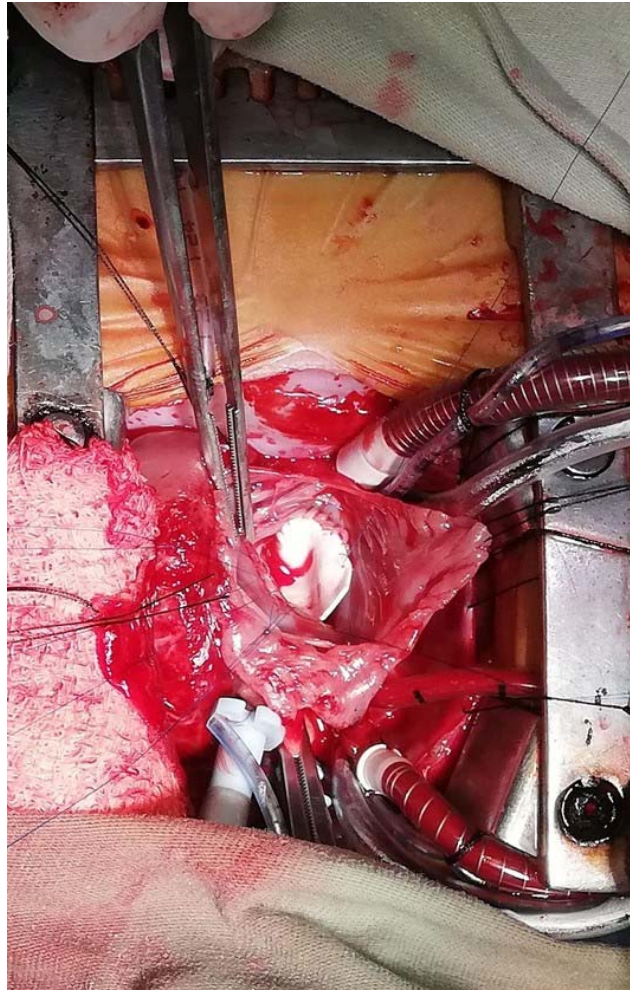
Report of the First Successful Senning Procedure from Nepal

Santosh Sharma Parajuli¹, Rabindra B. Timala², Marisha Aryal²

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²Department of Cardiac Surgery, Shahid Gangalal National Heart Center, Kathmandu, Nepal

3 years old male presented with history of bluish discoloration. Echocardiography showed transposition of great arteries with intact ventricular septum. Catheterization revealed LV systolic pressure of 36 mmHg, while systemic systolic arterial pressure was 80 mmHg. Due to his deconditioned left ventricle, decision was taken to do atrial switch. On 12th July 2022, he underwent modified Senning procedure. In the operation theatre, standard monitoring system including ECG, invasive blood pressure, central venous pressure, pulse oxymeter and temperature monitoring was established. The prebypass heart rate was between 102-124/min, opening CVP was 11 mmHg. Systolic blood pressure ranged between 81-93mmHg and diastolic blood pressure was between 42-47 mmHg. Pulse oxymeter showed patient oxygen saturation between 65-73% with FIO₂ of 60% and the arterial blood gas showed PaO₂ of 48mmHg. Atrial septum was excised and PTFE patch was used as first layer to separate mitral valve from pulmonary veins. Lateral wall of right atrium was sutured to the medial aspect of atrial septum to drain systemic vena cava into the mitral valve. Pericardial patch along with medial wall of right atrium was used to channel pulmonary venous return into the tricuspid valve. Total cardiopulmonary bypass time was 155 minutes. Total cross clamp time was 111 minutes. Patient was weaned from the Cardiopulmonary bypass with sinus rhythm and heart rate ranged between 108-118/min, CVP was 13mmHg. Patient was under inotropic support of Dopamine at 5mcg/kg/min and Adrenaline at 0.05mcg/kg/min. His systolic blood pressure ranged between 77- 81mmHg and diastolic blood pressure was between 38-42 mmHg. Pulse oxymeter showed patient oxygen saturation between 97-100% with FIO₂ of 60% and the arterial blood gas showed PaO₂ of 188mmHg. Patient was shifted to the intensive care unit with low dose of inotropic support and extubated the next day. He had atrial tachyarrhythmia on 3rd post-operative day, which subsided itself without any intervention. He was shifted out of ICU on 5th post op day. Echocardiography done at the time of discharge showed good biventricular function without any baffle leak. Patient was discharged on 8th post operative day and his hospital stay was uneventful. Patient had visited out-patient department for three-months follow-up. His echocardiography report showed unobstructed flow from pulmonary veins to RA baffle and unobstructed flow in SVC and IVC to Left Atrium.



AP2-3

Evaluation of an Enhanced Recovery Protocol in Pediatric Cardiac Surgical Patients in a Single Tertiary Care Unit

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Background: The pillars of Enhanced Recovery after Surgery (ERAS) include multi-modal analgesia, early extubation, rapid mobilization and recovery leading to a shorter ventilation time and reduced hospital stay. By adapting the ERAS protocol there is an associated reduced postoperative morbidity with congenital heart surgeries.

Methodology: In a retrospective observational study over two years (2021-2023), data was collected via medical records & patient's files which included those of Risk Adjusted Congenital Heart Surgery (RACHS) I & II, undergoing elective on pump cardiac surgery who were extubated up to 24 hours postoperative as per our unit protocol. Excluded were those who had missing or incomplete data, emergency cases and on preoperative ventilator. Demographics and parameters such as type of surgery, cardiopulmonary bypass time (CPB time), aortic cross clamp time (AOX time), ventilation time and ICU stay were compared, analysed using SPSS version 25 for Windows and Data as Mean \pm SD or Frequency (%). Our cohort made two groups-FastTrack extubation (<6 hours) (FE) and Delayed extubation (6-24 hours) (DE). The FastTrack sub-divided ?On table extubation (OTE) and early extubation (EE) (0-6 hours) Cross tabulations were computed for categorical variables and compared using the chi-square test ($P < 0.05$ -statistically significant).(table 1&2)

Results: Of the 1469 operated, 188 patients were included in this study. FastTrack group had 138 (33 ?OTE and 105 ?EE) and delayed extubation had 50 patients. Age, height and weight were significantly higher in the FE group as compared to DE group ($p < 0.04$). In contrast, CPB time and ICU stay was significantly lower in the fast-track group as compared to delayed ($p < 0.05$) both found statistically significant. Significantly higher percentage of patients in DE group had RACHS II as compared to early extubated (EE) ($p < 0.05$). No significant difference was observed between gender and RACHS in both groups.

Discussion: Owing to our established ERAS protocol (table 3) of use of multimodal analgesia (caudal & reduced IV opioid) our patients remained comfortable, pain free with stable hemodynamics leading to a safe, early extubation, associated with a shorter ICU stay (statistically significant) in the EE group. Enhanced recovery after surgery has proven benefits with regards to reduced ventilation & ICU stay. An individualized unit-based protocol inclusive of a team approach could improve overall outcomes.

Table 1: Comparison of FastTrack (<6 hours) and delayed (6-24) hours extubation

	<6 hours (n=138)		6 to 24 hours (n=50)		P value
	Mean±SD	Median (IQR)	Mean±SD	Median (IQR)	
Age (month)	42.9±37.7	34 (0-69)	32.2±42	12 (4.5-44)	0.006
Body length (cm)	86.38.3±25.6	83 (68-110)	79.4±25.7	69 (60-92)	0.011
Weight (kg)	11.7±7.3	9.3 (6.6-14.8)	9.2±6.3	6.9 (4.9-11.4)	0.004
Cardiopulmonary bypass time (minutes)	95±34	93 (70-117)	118±45	115 (90-141)	0.001
Aortic cross clamp time (minutes)	43.9±24	42 (25-60)	51±30	56 (30-70)	0.077
ICU stay (hours)	48.2±32.7	42.5 (24.8-60)	64.2±34.4	54.3 (40.6-74.6)	0.001
	<6 hours (n=138)		6 to 24 hours (n=50)		P value
	Freq.	%	Freq.	%	
RACHS					
1	50	36.2	9	18	0.020
2	88	63.8	41	82	
Gender					
Males	86	62.3	25	50	0.129
Females	52	37.7	25	50	
Surgery					
ASD closure	35	24.1	4	9.3	NA
ASD closure PAPVC	2	1.4	1	2.3	
ASD VSD closure	1	0.7	0	0	
Atrial Septectomy BDGS	11	7.6	5	11.6	
ASD repair	2	1.4	0	0	
BDGS	9	6.2	6	14	
BDGS + TV repair	1	0.7	0	0	
Fenestrated ASD closure	2	1.4	0	0	
HAPVC repair	2	1.4	0	0	
PDA ligation	1	0.7	1	2.3	
RVOTO relief	1	0.7	0	0	
SAM excision	2	1.4	0	0	
SV ASD repair	2	1.4	1	2.3	
VSD closure	52	35.9	1	48.8	
VSD closure PDA ligation	4	2.8	1	2.3	
VSD closure RVOT relief	5	3.4	0	0	
VSD RVOTO	6	4.2	0	0	
VSD closure SAM excision	4	2.8	0	0	
Wardens	6	4.1	1	2.3	

Table 2: Comparison between on table (0 hrs) and early extubation (<6 hours)

	On table (n=33)		1 to 6 hours (n=105)		P value
	Mean±SD	Median (IQR)	Mean±SD	Median (IQR)	
Age (month)	41.2±32.3	38 (9-65.5)	43.4±39.4	33 (10-72)	0.951
Body length (cm)	89.2±22.9	94 (22.9-105)	88.1±26.5	80 (68-112)	0.676
Weight (kg)	11.9±7.0	10.6 (7.3-14.0)	11.7±7.5	9.1 (6.5-15)	0.654
Cardiopulmonary bypass time (minutes)	88±26	85 (68-108)	97±36	94 (71-123)	0.224
Aortic cross clamp time (minutes)	40±16	39 (29-52)	45±25	43 (28.3-60)	0.327
ICU stay (hours)	36.8±22.2	36 (20.2-44.8)	51.8±34.6	45.5 (30-65.3)	0.00
	On table (n=33)		1 to 6 hours (n=105)		P value
	Freq.	%	Freq.	%	
RACHS					
1	15	45.5	35	33.3	0.206
2	18	54.5	70	66.7	
Gender					
Males	25	75.8	61	58.1	0.068
Females	8	24.2	44	41.9	

Table 3-Institutional Enhanced Recovery after surgery (ERAS) protocol: Criteria for extubation

- RACHS category 1 and 2
- Age > 6 months
- CPB duration of < 120 minutes
- Vasoactive-inotropic score (VIS) at extubation <5 and ABG lactate <2
- Effective multi-modal analgesia (caudal morphine 100mcg/kg and clonidine 2 mcg/kg with pre-emptive NSAID analgesia), local infiltration with 0.25% bupivacaine at surgical site at end of procedure along with minimal fentanyl consumption (1-2 mcg/kg)
- Postoperative ECHO- good ventricular function and no residual shunts/defects
- Adequate reversal of muscle relaxant with good airway reflexes prior to extubation

AP2-4

Multisystem Inflammatory Syndrome in Children. An Emerging Clinical Challenge for Pediatric Cardiac Surgery in the COVID 19 Era: Case Series

Withdrawn

AP2-5

Anesthetic Management of Patent Ductus Arteriosus Ligation by Video-Assisted Thoracoscopy in Premature Babies Low-Birth Weight<2kg: A Retrospective Observational Study

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Background: Thoracoscopic surgery in neonates and infants for Patent Ductus Arteriosus (PDA) is widely used in recent years and thoracoscopy is currently considered the standard approach for several procedures. But so far, there have been no reports of video-assisted thoracoscope for PDA ligation in low-weight babies.

Objective: To retrospectively analyse the anesthetic management, complications and hemodynamic changes in neonates extremely low-birth weight<2kg undergoing video-assisted thoracoscopy for PDA ligation.

Methods: This a single-center, retrospective study. Clinical data from 21 neonates, <2kg, who underwent video-assisted thoracoscope for PDA ligation in our hospital from January 2017 to November 2021 were retrospectively analyzed. Main outcomes considered were hemodynamic stability or vasoactive medication requirements, hypothermia, intubation time after the surgery, postoperative acute kidney injury and perioperative red blood cell transfusion.

Results: All patients received general anesthesia with endotracheal intubation and standard ASA monitoring. All patients survived the surgery. Our anesthetic management protocols are outline and analyzed.

Discussion: Perfect preoperative preparation is crucial for obtaining a desirable postoperative outcome in neonates undergoing a thoracoscopy repair of PDA. In our analysis, intraoperative ventilation strategies included pressure control ventilation with peak airway pressure maintained at 15-25 cmH₂O, a respiratory rate of 35-55 breaths/minute, a fraction of inspired oxygen (FiO₂) of 40-60%, and careful airway suctioning to clear secretions. Maintain hemodynamic stability and normovolemia during intraoperative are critical for successful weaning of ventilatory support and extubation.

Anesthetic Experience of Repair of Esophageal Atresia in a Child with BPFM, Esophageal Atresia, and Full-length Tracheal Stenosis

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Department of Anesthesiology, Kobe Children's Hospital, Kobe, Hyogo, Japan

Background: There are no reports of anesthesia with BPFM and full-length tracheal stenosis. In this report, we describe our experience in the anesthetic case with BPFM, esophageal atresia, and full-length tracheal stenosis undergoing repair of esophageal atresia.

Case Description: She was born at 34 weeks, 1488 g. She was diagnosed with VACTERAL association and Klippel-Feil syndrome due to esophageal atresia C, vertebral dysplasia, and other findings. Abdominal esophageal banding, gastrostomy, and colostomy were performed at day zero, and there was resistance under the glottis even with a cuffless ID 2.5 mm tracheal tube. On day 118, rigid bronchoscopy was scheduled, but after administration of muscle relaxants, the patient became 'cannot intubate-cannot ventilate'. Finally, a soft bronchoscopy under spontaneous breathing was performed, which confirmed stenosis of the left main bronchus. The patient was transferred to our hospital, and a rigid bronchoscopy under general anesthesia was performed at 5 months of age. The patient had a bifurcation into a right main bronchus and a tracheoesophageal fistula at the level of the second tracheal ring, and the right main bronchus was all complete tracheal rings. The left main bronchus was also bifurcated beyond the tracheoesophageal fistula and was diagnosed as BPFM. At 6 months of age, tracheoesophageal fistula surgery, abdominal esophageal de-banding, and esophageal anastomosis were performed. This time, Mask ventilation was easy, and a cuffless ID 3.5 mm tracheal tube was intubated nasally. The tube tip was placed at the level of the second tracheal ring and inserted only about 1 cm below the glottis. There were many leaks around the tracheal tube, and the artificial nose was inadequately humidified. The hardened secretions frequently resulted in poor ventilation. The possibility of accidental extubation required careful airway management. Fortunately, the patient survived the surgery without any problems such as accidental extubation.

Discussion: Management of the tracheal tube which was placed only 1 cm below the glottis was quite challenging, but the fact that the patient's neck mobility was quite limited due to Klippel-Feil syndrome worked in the positive direction. The trachea above the full complete tracheal ring was dilated, and although it was anticipated that there would be more tube leakage, a cuffed tracheal tube could not be used because of the restriction of cuff insertion below the glottis.

AP2-7

Anesthetic Management in a Child with Single Ventricle Heart Undergoing Drainage of Brain Abscesses

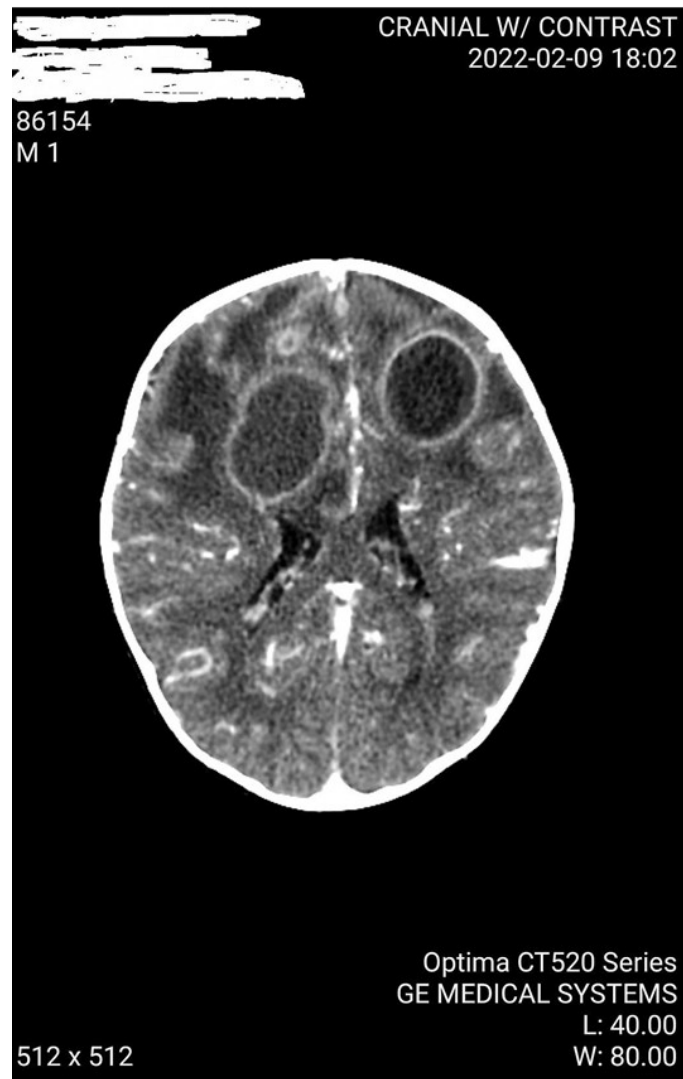
Pryl Kim Ngoslab^{1,2}, Raisa Tumbocon¹

¹Saint Louis University -Sacred Heart Medical Center, ²Baguio General Hospital and Medical Center

Single ventricle congenital heart disease is uncommon, with incidence of 3.1-4.9 per 10,000 live births. Brain abscess is a rare but fatal complication of cyanotic heart disease. Its incidence among children with cyanotic CHDs are 5-18%. If untreated, mortality is 27.5-71%. Thus it is imperative that prompt treatment be done after diagnosis.

Case: This is a case of a 1 year 7 months old male known with congenital heart disease, single ventricle with atrial inversion and abdominal situs invertus. He presented with a 5 week history of left sided hemiparesis. CT scan done showed multiple cystic lesions in the bilateral frontal lobe (Figure 1). Bilateral tube drainage of abscess was done successfully.

Discussion: Brain abscess is a rare but fatal complication of CHD. Patients with CHD develop polycythemia which results in tissue hypoxia and ischemia creating a suitable environment for the growth of bacteria. The right-to-left shunting allows bacteria in the airway to enter the cerebral circulation. Prompt intervention prevents mortality brought about these abscesses. Anesthetic goals in patients with single ventricle include maintaining normovolemia and slight hypercapnia, avoiding excessive pulmonary blood flow, maintenance of O₂ saturations at baseline, supporting cardiac contractility and preventing atelectasis and intrapulmonary shunting. Overall, there should be a balance between pulmonary and systemic hemodynamics in order to prevent end-organ damage. With the above considerations in mind, anesthetic agents used for this patient was carefully selected. Anesthetic done was total intravenous anesthesia with endotracheal tube for airway. On induction, Midazolam was given for anxiolysis. Fentanyl was used to attenuate the hemodynamic response to laryngoscopy and because it has minimal effect on cardiac contractility and systemic vascular resistance. Bupivacaine 0.125% was infused on the surgical site prior to surgery for added pain control. It is important to address anxiety and pain as this may invoke unpredictable rise in pulmonary and systemic resistance. Ketamine has an onset of action of 15-30 seconds making it an ideal agent for induction of anesthesia in children. It increases SVR while PVR is unaffected. Anesthesia was maintained on Midazolam, Fentanyl and Rocuronium. Intravenous fluid given intraoperatively was pNSS at maintenance rate. Brain abscess was successfully drained and patient was discharged after almost a month of treatment.



AP2-8

Anesthetic Management in a Child with Late Onset Congenital Diaphragmatic Hernia Undergoing Repair

Anna Loraine Ostrea, Pryl Kim Ngoslab

Baguio General Hospital and Medical Center

Congenital Diaphragmatic hernia (CDH) presents as underdeveloped diaphragm resulting in herniation of abdominal organs in the thoracic cavity. In the Philippine epidemiology, 35.82 cases per 10,000 live births were noted under a disease classification. It generally occurs in 1 in 2500-3000 live births with late onset arising at 2.4-20% of CDH patients. We aim to present a rare case of late onset congenital diaphragmatic hernia and discuss our experience in the difference of presentation and management compared to the typical presentation.

The patient is a case of a 2-year-old male presenting as a recurrent vomiting initially managed for acute gastroenteritis with dehydration. CDH was diagnosed after a chest radiograph was done when patient developed respiratory symptoms.

Due to limited studies, patient management was guided by the considerations of CDH in typical cases and was tailored according to patient's individual indications. In a typical CDH management, optimization of pulmonary hypoplasia, pulmonary hypertension and accompanying associated congenital anomalies is the goal. Intra and post operative management generally includes employment of invasive monitoring with specific ventilatory strategies and prolonged intensive care. Prognosis is poor with severe cases and chronic problems are encountered for those who survive. In our case, anesthetic management focused on preoperative optimization for hydration with minimal respiratory support not needing advance airway for ventilation. Patient had no associated congenital problems after preoperative surveillance for other congenital anomalies. Intra operatively, standard monitors with end tidal carbon dioxide were employed. Avoiding abdominal distention on induction prevented quick desaturation during laryngoscopy. Careful inflation of the lung after CDH repair prevented injury on the unaffected lung. Post operative management composed of early weaning from ventilator which he tolerated within 24 hours of intensive care. Patient was also sedated overnight to give time for the body to adjust to the new lung volume. Multimodal pain management strategy, considering respiratory optimization, is done using intravenous Paracetamol and epidural analgesia. Patient was discharged on post operative day 5 with no problems encountered on follow up. The use of less extensive and invasive strategies with individualized approach was favorable for our patient.





Day 2_Room C

Abstract Presentation 3 (In-person)

Chair(s): Eugene Kim (Korea)

Young Sung Kim (Korea)

Perioperative Hypothermia in Pediatric Population in University Malaysia Medical Centre

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Background: Perioperative hypothermia in the pediatric population has been associated with adverse events and serious complications. Incidences vary between studies, ranging from as low as 20% to as high as 85%. Risk factors include low body weight, small and sick children, inadequate temperature monitoring, major intestinal surgery, operating theatre temperature less than 23°C, Interventional cardiac procedures, older age group, type and duration of surgery and low baseline temperature. This study aims to describe perioperative hypothermia pediatric population incidence in UMMC and evaluate its associated factors.

Method: This observational cohort study included prospectively recorded data from patients younger than 16 years old undergoing general anesthesia for surgical or diagnostic procedures at University Malaya Medical Centre. A structured data collection form included perioperative data on the patient's demographic, ASA status, and surgical, clinical and anesthetic characteristics. Intraoperative data collected were surgery type, duration of anesthesia and surgery, estimated blood loss, blood transfusion, total fluids, all warming methods, temperature monitoring type and measurements throughout perioperative periods. Perioperative hypothermia was defined as temperature (T) < 36°C.

Results: Of the 144 patients studied, hypothermia was recorded were 70 (53.8%) in 1st hour of the operation, 42 (40.4%) during 2nd hour, 24 (36.9%) in the 3rd hour, 10 (27.0%) in the 4th hour and 18 (12.5%) in the post-anaesthesia unit. Age, weight, ASA and surgical type were not associated with hypothermia. There were also no significant differences in techniques of preventive measures between normothermic and hypothermic groups.

Discussion/Conclusion: We hereby report a 12.7% incidence of hypothermia amongst our local pediatric surgical patients, a much lower incidence than other reports. We could not identify the significant variables between the patients in the hypothermic group. However, age, weight, ASA, and surgical type were insignificant predictors. Most of our patients received at least one type of preventive hypothermia measure. And there were no significant differences found between the patients' preventive measures. This may be due to the small sample size and the potential cofounders needed to be considered in this study, such as environmental factors and preoperative medications.

Data Analysis**Table 1. Patient Demographics and Clinical characteristic in Normothermic and Hypothermic patient groups**

Variables		N Total (N = 144)	Normothermic, ≥ 36 °C (n = 124)	Hypothermic, < 36 °C (n = 18)	p-value
Age category	0 - < 1 y	32 (22.5%)	28 (19.7%)	4 (2.8%)	0.716
	1 - < 5 y	44 (31.0%)	39 (27.5%)	5 (3.5%)	
	5 - < 10 y	33 (23.2%)	30 (21.1%)	3 (2.1%)	
	10 - ≤ 16 y	33 (23.2%)	27 (19.0%)	5 (4.2%)	
Gender	Male	94 (66.2%)	82 (57.7%)	12 (8.5%)	0.964
	Female	48 (33.8%)	42 (29.6%)	6 (4.2%)	
Weight (kg)		n = 138	20.95 ± 18.32	24.86 ± 20.68	0.418
BMI (kg/m ²)		n = 138	17.43 ± 6.88	15.43 ± 6.88	0.212
ASA, n (%)	1	64 (45.1%)	55 (38.7%)	9 (6.3%)	0.538
	2	58 (40.8%)	50 (35.2%)	8 (5.6%)	
	3	20 (14.1%)	19 (13.4%)	1 (0.7%)	
Surgical level	Minor	47 (33.1%)	38 (26.8%)	9 (6.3%)	0.211
	Intermediate	63 (44.4%)	56 (39.4%)	7 (4.9%)	
	Major	32 (22.2%)	30 (21.1%)	2 (1.4%)	

Categorical variables were expressed as frequency and percentage; n (%)

Continuous variables were expressed as mean ± standard deviation for normally distributed and median (IQR) for non-parametric distributed.

Chi-square test or Fisher's exact test was used to check for significant differences for categorical variables.

Independent t-test or a Whitney rank test was used to check for any significant differences for continuous variables.

*Significant level p < 0.05

Table 2. Temperature monitoring

Variables	N Total (N = 144)	Normothermic, ≥ 36 °C	Hypothermic, < 36 °C	t-stat	p-value
Receiving Bay	136	36.50 ± 0.50; n = 118	36.34 ± 0.63; n = 18	-0.998	0.320
After Induction	133	35.70 ± 0.75; n = 117	35.96 ± 0.66; n = 16	1.353	0.179
Intra-operative					
1 st hour	129	35.79 ± 0.78; n = 117	35.83 ± 0.57; n = 12	0.156	0.877
2 nd hour	103	35.96 ± 1.35; n = 95	36.0 ± 0.39; n = 8	0.084	0.934
3 rd hour	65	36.23 ± 0.82; n = 58	36.0 ± 0.45; n = 7	-0.743	0.460
4 th hour	37	36.43 ± 1.07; n = 32	35.92 ± 0.51; n = 5	-1.025	0.312
PACU	142	36.64 ± 0.63; n = 124	35.57 ± 0.38; n = 18	-7.100	<0.001*

#Independent t-test for two-sided level significant

*Significant level p <0.05

Table 3. Preventive measures

Variables		N Total (N = 144)	Normothermic, ≥ 36 °C (n = 127)	Hypothermic, < 36 °C (n = 17)	p-value
Pre-warmed fluid	Yes	126 (87.5%)	111 (78.2%)	15 (10.6%)	0.438
	No	16 (11.3%)	13 (9.2%)	3 (2.1%)	
Pre-warmed patient	Yes	82 (57.7%)	71 (50%)	11 (7.7%)	0.757
	No	60 (42.3%)	53 (37.3%)	7 (4.9%)	
Active warming	Yes	134 (93.1%)	118 (83.1%)	16 (11.3%)	0.281
	No	8 (6.9%)	6 (4.2%)	2 (1.4%)	
Passive warming	Yes	137 (96.5%)	119 (83.8%)	18 (12.7%)	0.386
	No	5 (3.5%)	5 (3.5%)	0 (0)	
PACU warming	Yes	116 (81.7%)	101 (71.1%)	15 (10.6%)	0.847
	No	26 (18.3%)	23 (16.2%)	3 (2.1%)	

Chi-square test for two-sided level significant

*Significant level p <0.05

AP3-2

Atelectasis and Re-Expansion Pulmonary Edema in Patient Undergoing Atrial Septal Defect (ASD) Closure with Minimally Invasive Cardiac Surgery

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Background: Despite providing many benefits, minimally invasive cardiac surgery can cause potential complications that leads to morbidity and mortality. Here we present a case about atelectasis and re-expansion pulmonary edema complication during atrial septal defect closure with right thoracotomy approach.

Case Description: A 23 years old female came to the hospital for ASD closure. She experienced shortness of breath with moderate intensity activities. Echocardiography showed ASD with 25.4 mm diameter. Cardiac catheterization revealed pulmonary hypertension (PH) reactive to oxygen test. General anesthesia, intubation with 35 Fr left double lumen tube, and invasive monitoring was applied. Right thoracotomy and one lung ventilation (OLV) was done with low tidal volume and PEEP. ASD closure was done in 33 minutes cardiopulmonary bypass (CPB) time and 20 minutes aortic cross clamp time. After weaning from CPB, desaturation occur until 70%. Only left lung was ventilated after CPB. Tidal volume was only 100 ml despite lung recruitment maneuver. Because of hemodynamic instability we commenced two lung ventilation. Oxygen saturation rise to 95%. Operation was done with intermittent deflation of the right lung. There was pink frothy secret from the right lung. The secret was suctioned carefully. Chest X-ray showed atelectasis in the left lung.

Discussion: PH is not an absolute contraindication but tend to increase risk of hypoxemia and right ventricular failure during OLV. Permissive hypercapnia was common in OLV but may not be appropriate for PH. Management of severe hypoxemia during OLV beside lung recruitment maneuver, was inflating the other lung. Higher PEEP and intrathoracic pressure had negative effect on venous return and pulmonary vascular resistance that compromise hemodynamics. Re-expansion of the nondependent lung need coordination with the surgeon to ensure they work safely. Alveoli on nondependent lung were easier to recruit, but sudden expansion of the lung can create shear stress and re-expansion pulmonary edema. This phenomenon was rare, but potentially fatal. Proper titration of PEEP and inspiratory pressure reduced the risk. High oxygen fraction had to be avoided because re-expansion was linked to oxidative stress which is cytotoxic and stimulate inflammation. Management of re-expansion pulmonary edema remain conservative with protective lung ventilation using low tidal volume, appropriate level of PEEP and negative fluid balance.



Figure 1. Post operative chest x-ray



Figure 2. Pre operative chest x-ray

AP3-3

Activation of Rapid Response Team in Pediatric Ward : A Cross Sectional Study in Indonesia's Top Referral Hospital

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Background: Rapid Response Teams (RRT) goal is to identify and rapidly assess patient's at risk of clinical decompensation and thus to prevent cardiac arrest. In Cipto Mangunkusumo Hospital (CMH), RRT activation can be performed based on single criteria or PEWS. This study aim to describe the activation triggers and characteristic of pediatric patients treated by RRT in CMH.

Methods: A cross-sectional study. Consecutive pediatric (<18 years) RRT events from January 2020 to Desember 2022 in tertiary care hospital CMH were included.

Results: 493 RRT activations for pediatric patients from 4,094 total RRT activation during the study period. 75.5% (372 of 493) of RRT events occurred during daytime hours. The main trigger for RRT activation was oxygen desaturation (43.8%) (Table 1). Among 22 groups of diagnosis, the largest primary diagnosis was neoplasm (26%), followed by congenital malformations, deformations, and chromosomal abnormalities (19%), and diseases of nervous system (9%) (Fig.1). 91.1% (449 of 493) were actively treated and 8.9% receiving "do not attempt resuscitation" orders. The outcome of the patients was 79.1% alive and 20.9% died during RRT events. The mortality rate of RRT events from 2020 to 2022 was 28%, 17.8%, and 18.1% respectively. In-hospital mortality following RRT activation are highest due to neoplasm (30.1%). Of pediatric RRT events, 12.6% (62 of 493) were admitted to PICU, and 87.4% (431 of 493) stayed in the ward where the call was made.

Discussion: In our study, daytime hours were defined as 07:00 AM to 10.59 PM. In line with the study by Raymond et al (2015), 70.2% of pediatric medical emergency team events occurred during daytime hours and the most trigger for activation RRT was decreased oxygen saturation (32%). Study by Martinez et al (2018) in tertiary-care pediatric hospital in Australia, the number of patient who admitted to PICU after RRT events was 24%, that was higher compare to our study. The possible reason might be due to the capacity of PICU in Cipto Mangunkusumo Hospital was limited. In children cardiac arrest is generally caused by progressive respiratory failure, hypotension or both. With the existence of rapid response system (early detection and activation based on a single criteria or PEWS), we hope it can reduce the incidence of cardiac arrest and reduce intrahospital deaths. However, further studies are still needed regarding the effectiveness of the rapid response system in the pediatric population.

Fig.1 Patients Diagnosis (ICD X) Prior to RRT Activation in Pediatric Patients

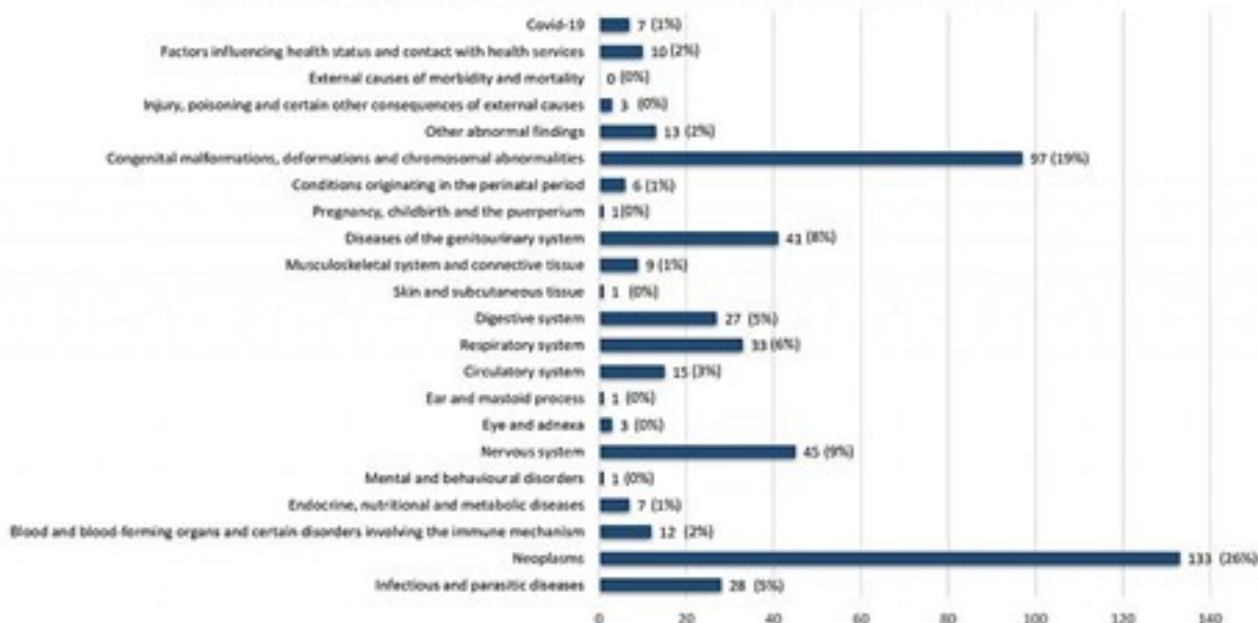


Table 1. Characteristic of RRT Activation

Age	
Mean (years)	6.6
Sex	
Male (n,%)	278 (56.4%)
Female (n,%)	215 (43.6%)
Response time	
< 5 minutes	432 (87.63%)
> 5 minutes	61 (12.37%)
RRT Activation Time	
Daytime (07.00-22.59)	372 (75.5%)
Nighttime (23.00-06.59)	121 (24.5%)
Mortality	
Alive (n,%)	390 (79.1%)
Dead (n,%)	103 (20.9%)
DNR	
Yes (n,%)	44 (8.9%)
No (n,%)	449 (91.1%)
RRT Activation Triggers	
Respiratory Arrest	65 (13.2%)
Cardiac Arrest	42 (8.5%)
Airway threat	51 (10.3%)
Desaturation	216 (43.8%)
Tachypnea	10 (2.0%)
Hypotension	5 (1.0%)
Bradycardia	3 (0.6%)
Tachycardia	3 (0.6%)
Acute loss of consciousness	44 (8.9%)
Seizure	28 (5.8%)
PEWSS score >6	17 (3.4%)
Worry about patient's situation	9 (1.8%)

AP3-4

Towards a Zero Postoperative Vomiting (POV) in Children after Tonsillectomy

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Background and Objective: Studies have quoted 13-42% postoperative vomiting (POV) in children after tonsillectomy. Postoperative vomiting can result in severe distress to child and family/care giver. POV can provoke pain in oropharynx, delay oral intake, lead to dehydration, delay recovery from surgery and can delay discharge from hospital. Besides an unpleasant perioperative experience for the child, there is a significant diversion of finite resources from the postoperative care team. Anaesthetic and surgical risk factors have been under the microscope for over two decades. This study was conducted to find the incidence of early (less than 6 hours) postoperative nausea and vomiting in children after tonsillectomy in a regional private hospital and how the results may influence our future approach to a possible zero POV.

Methods: Retrospective chart review, clinical audit.

Population: 370 (Three hundred and seventy) children, who had tonsillectomy performed by same surgeon and anaesthesia provided by same anaesthetist; surgical technique; mode of anaesthesia and prophylactic anti emetics were the same. Age: 3 to 16 years, Period: 4years (2019-2022), Sample: 300 (Three hundred). From the sample charts, number of children who reported/experienced nausea or POV within 6 hours after tonsillectomy were found and those charts analysed.

Results: Eleven children (incidence of 3.7%) reported/experienced nausea or vomiting within 6 hours of tonsillectomy and they received rescue antiemetics with desired effect.

Discussion: The incidence of early POV in children after tonsillectomy in this centre is 3.7%, which is significantly less than published literature. There were no identifiable added risk factors to the POV group. The conduct of perioperative anaesthesia and surgical technique for tonsillectomy in children continue to evolve and refine to enhance a safe recovery and a positive experience and outcome. While we strive to achieve a zero POV, perhaps it is time to examine more closely other factors like child and parents' preoperative education, their attitude, emotions, and psychological support; quantity and quality of pre and postoperative oral intake; underuse of multimodal analgesia and adjuvants; protocol driven or unwarranted prescription of post operative opioid analgesics; subjective or objective reporting and interpretation of nausea and vomiting; all of which may have a greater influence in achieving a zero POV than current evidence.

AP3-5

Anesthetic Management in a Patient with Nonketotic Hyperglycinemia

Withdrawn

AP3-6

Distraction Techniques for Post-operative Paediatric Patients in Post Anaesthesia Care Unit (PACU) a Randomized Control Trial

Virtual

Perioperative Respiratory Adverse Events Following General Anesthesia among Pediatric Patients after COVID-19

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Background: We examined the association between preoperative coronavirus disease 2019 (COVID-19) Omicron infection and the incidence of overall perioperative adverse events in pediatric patients who received general anesthesia.

Methods: This retrospective study included patients aged <18 years who received general anesthesia between February 1 and June 10, 2022, in a single tertiary pediatric hospital. They were divided into two groups: patients in a COVID-19 group were matched to patients in a non-COVID-19 group in the Omicron-predominance in Korea. Data on patient characteristics, anesthesia records, post-anesthesia records, COVID-19-related history, symptoms, and mortality were collected. The primary outcomes were the overall perioperative adverse events including perioperative respiratory adverse events (PRAEs), escalation of care, and mortality.

Results: In total, 992 patients were included in data analysis (n=496, COVID-19; n=496, non-COVID-19) after matching. The overall incidence of perioperative adverse events was significantly higher in the COVID-19 group than in the non-COVID-19 group (OR 1.92; 95% CI 1.89-1.94). The difference was notable in PRAEs (OR 2.00; 95% CI 1.96-2.02) but not in the escalation of care or mortality. Compared with the non-COVID-19 group, the risk of overall perioperative adverse events was higher in the COVID-19 group diagnosed 0-2 weeks (OR 6.5; 95% CI 2.1-20.4) or symptomatic at anesthesia day (OR 6.4; 95% CI 3.30-12.4).

Conclusion: Pediatric patients with preoperative COVID-19 Omicron infection had an increased risk of PRAEs but of similar severity to an upper respiratory infection. Patients within 2 weeks after COVID-19 or those with symptoms had a higher risk of PRAEs.

Table 1. Patient and surgical characteristics, and anesthetic management of COVID-19 patients and non-COVID-19 patients after propensity score matching (PSM).

	All (n=992)	Non-COVID-19 (n=496)	COVID-19 (n=496)	OR or mean difference	95% CI of OR or mean difference	STD before PSM	STD after PSM	P-value
Age (month)	6.5 ± 4.5	6.6 ± 4.7	6.3 ± 4.2			0.261	-0.058	0.371
Sex						0.101	0.017	0.844
Male (%)	662 (66.7%)	309 (62.3%)	313 (63.1%)					
Female (%)	370 (37.3%)	187 (37.7%)	183 (36.9%)					
Weight (kg)	28.2 ± 18.8	28.3 ± 19.4	28.0 ± 18.3			0.241	-0.018	0.788
Height (cm)	117.5 ± 30.5	117.5 ± 31.9	117.4 ± 29.1					0.962
ASA physical status								0.865
I	418 (42.1%)	211 (42.5%)	207 (41.7%)					
II	449 (45.3%)	224 (45.2%)	225 (45.4%)					
III	112 (11.3%)	56 (11.3%)	56 (11.3%)					
IV	13 (1.3%)	5 (1.0%)	8 (1.6%)					
Emergent surgery	29 (2.9%)	23 (4.6%)	6 (1.2%)	0.252	0.245 – 0.259			0.003
Grade of surgery				0.907	0.90 – 0.92			0.557
Major	247 (24.90%)	128 (25.6%)	119 (22.2%)					
Minor	745 (75.10%)	368 (74.2%)	377 (76.0%)					
Anesthesia management								
Duration of anesthesia (min)	111.8 ± 101.5	102.7 ± 89.5	120.9 ± 111.6	18.3	5.7 – 30.9			0.005
Duration of surgery (min)	72.3 ± 85.4	66.6 ± 73.6	78.0 ± 95.5	11.4	0.78 – 22.0			0.036
Anesthesia induction								
Intravenous induction	992 (100.0%)	496 (100.0%)	496 (100.0%)	N/A	N/A			1.00
Inhalation induction	0 (0%)	0 (0%)	0 (0%)	N/A	N/A			
Maintenance of anesthesia								
Intravenous agents	85 (8.6%)	34 (6.9%)	51 (10.3%)	1.56	1.53 – 1.58			0.070
Inhalation agents	907 (91.4%)	462 (93.1%)	445 (89.7%)	0.64	0.63 – 0.65			0.070
Airway management device								0.134
Endotracheal tube	403 (40.6%)	201 (40.5%)	202 (40.7%)	1.01	1.00 – 1.02			
Supraglottic airway device	585 (59.0%)	291 (58.7%)	294 (59.3%)	1.03	1.02 – 1.03			
No device	4 (0.403%)	4 (0.81%)	0 (0%)	0	0			

Values are mean ± standard deviation, or median (interquartile range) [range] or number (proportion). ASA, American Society of Anesthesiologists; STD, standardized difference.

Table 2. Overall perioperative adverse events including perioperative respiratory adverse events (PRAEs), escalation of care, and mortality of COVID-19 patients and non-COVID-19 patients.

	All (n=992)	Non-COVID-19 (n=496)	COVID-19 (n=496)	OR or mean difference	95% CI of OR or mean difference	P-value
Overall perioperative adverse events	114 (11.5%)	41 (8.3%)	73 (14.7%)	1.92	1.69 – 1.94	0.002
Escalation of care, or mortality						
Unexpected general ward admission	3 (0.302%)	2 (0.40%)	1 (0.202%)	0.50	0.46 – 0.54	1.00
Unexpected ICU admission	2 (0.202%)	1 (0.202%)	1 (0.202%)	1	0.92 – 1.09	1.00
Unexpected respiratory support	2 (0.202%)	1 (0.202%)	1 (0.202%)	1	0.92 – 1.09	1.00
All-cause mortality within 6 weeks	0 (0.0%)	0 (0.0%)	0 (0.0%)	N/A	N/A	N/A
PRAEs	111 (11.2%)	39 (7.9%)	72 (14.5%)	2.00	1.96 – 2.02	0.001
Laryngospasm	17 (1.7%)	11 (2.22%)	6 (1.21%)	0.54	0.52 – 0.56	N/A
Brachospasm	0 (0.0%)	0 (0.0%)	0 (0.0%)	N/A	N/A	N/A
Pneumonia	0 (0.0%)	0 (0.0%)	0 (0.0%)	N/A	N/A	N/A
Crackle or Wheezing	4 (0.403%)	0 (0.0%)	4 (0.81%)	N/A	N/A	0.133
Copious secretion requiring endotracheal suction	8 (0.81%)	1 (0.202%)	7 (1.41%)	7.1	6.6 – 7.6	0.076
High peak inspiratory pressure (≥ 25 cmH ₂ O)	34 (3.43%)	3 (0.60%)	31 (6.2%)	11.0	10.5 – 11.4	<0.001
Airway obstruction (Chest retraction)	36 (3.63%)	17 (3.43%)	19 (3.83%)	1.12	1.10 – 1.15	0.87
Desaturation (SpO ₂ < 95%)	52 (5.2%)	27 (5.4%)	25 (5.0%)	0.92	0.91 – 0.94	1.00
During anesthesia induction	2 (0.202%)	1 (0.202%)	1 (0.202%)	1	0.92 – 1.09	1.00
During emergence from anesthesia (Including laryngospasm)	23 (2.5%)	12 (2.42%)	11 (2.22%)	0.91	0.89 – 0.94	1.00
Desaturation in PACU	27 (2.72%)	14 (2.82%)	13 (2.62%)	0.93	0.90 – 0.95	1.00
Oxygen after PACU (> 2 hours)	14 (1.4%)	10 (2.03%)	4 (0.83%)	0.39	0.38 – 0.41	0.174
Postoperative care						0.826
ICU	92 (9.3%)	48 (9.7%)	44 (8.9%)	0.91	0.90 – 0.92	
PACU	900 (90.7%)	448 (90.3%)	452 (91.1%)	1.10	1.08 – 1.11	
PACU stay (min)	34.0 ± 22.5	24.9 ± 25.0	43.0 ± 15.0	18.12	15.43 – 20.81	<0.001
After PACU care						
Ward		211 (42.1%)	194 (42.9%)	0.84	0.84 – 0.85	
Day-surgery center		237 (47.8%)	258 (52.0%)	1.18	1.17 – 1.19	

Values are mean ± standard deviation, or median (interquartile range) [range] or number (proportion).

COVID-19, coronavirus disease 2019; ICU, intensive care unit; N/A, not applicable; OR, odds ratio; PACU, post-anesthesia care unit; SpO₂, oxygen saturation.

Platelet-lymphocyte Ratio and Neutrophil-lymphocyte Ratio for Predicting Respiratory Complications after Congenital Heart Surgery

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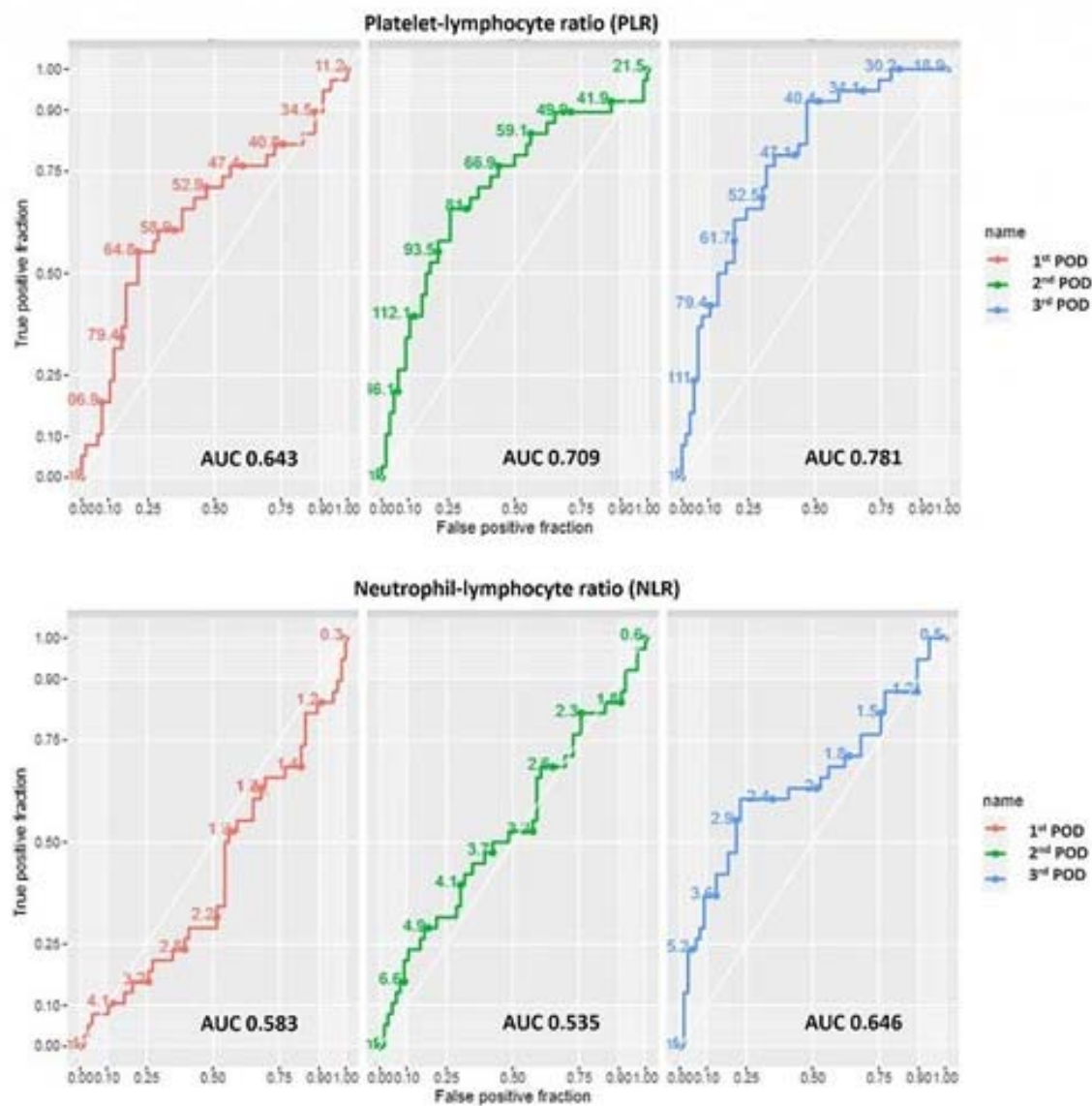
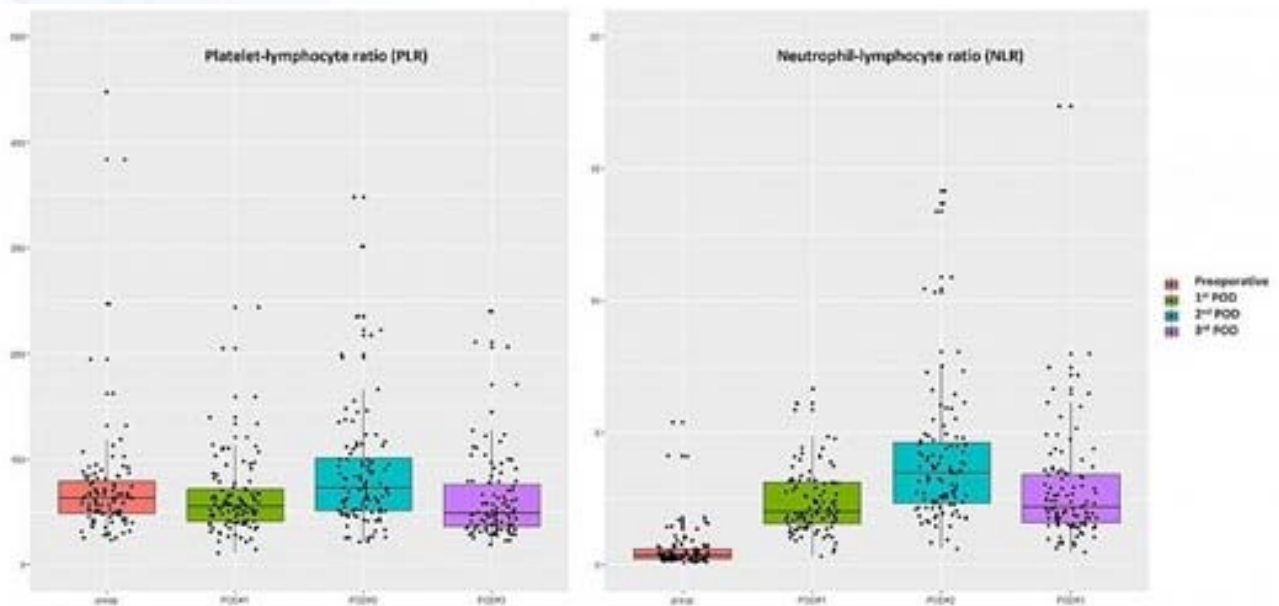
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Background: Young infants undergoing congenital heart surgery are at risk of postoperative adverse outcomes, which are contributed by the inflammatory response. Platelet-lymphocyte ratio (PLR) and neutrophil-lymphocyte ratio (NLR) have scarcely been reported as immune-inflammatory indices associated with the prognosis in children with congenital heart disease. We examined prognostic ability of PLR and NLR on postoperative respiratory complications after congenital heart surgery in young infants.

Methods: We retrospectively collected data on 104 patients younger than 1 year who underwent corrective or palliative cardiac surgery for congenital heart disease, and calculated cell count indices (PLR and NLR). Receiver operating characteristic curves analysis was used to evaluate predictive ability of postoperative PLR and NLR for respiratory complications, which were defined as pneumonia, acute respiratory failure, prolonged mechanical ventilation (>48 hours), or reintubation within 30 days after surgery.

Results: Thirty-eight patients (37%) developed respiratory complications. Patients developed respiratory complications were younger, more frequent cyanosis, and higher preoperative B-type natriuretic peptide compared with those who did not. Postoperative PLR did not show a significant change compared with preoperative value. After surgery, NLR increased and showed a peak value on the 2nd postoperative day (POD) (Fig.1). On the 3rd POD, PLR showed an area under the curve (AUC) of 0.781 (95% CI 0.689-0.856, $P<0.001$) with 92.1% sensitivity and 53.0% specificity to predict respiratory complications at a cut-off >41.34. NLR values on the 3rd POD had an AUC 0.646 (95% CI 0.546-0.738, $P<0.001$) with a cut-off >2.74 (Fig.2).

Conclusion: Elevated postoperative PLR and NLR can predict respiratory complications after congenital heart surgery in young infants. These biomarkers may be used as systemic inflammatory indices, which are simple and easily accessible methods.





Day 2_Room C

Abstract Presentation 4 (In-person)

Chair(s): Sang Hun Kim (Korea)
Hyun Kang (Korea)

AP4-1

Transversus Abdominis Plane Block after Sub Arachnoid Block Reduces Postoperative Pain Intensity and Analgesic Consumption in Elective Lower Abdominal Surgeries in Pediatric Patients - Case Series

Gunjan Singh

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Transversus abdominis plane (TAP) block reduces post operative pain of Lower Abdominal Surgery in pediatric patients. The primary outcome of this study was the evaluation of the efficacy of TAP block on pain intensity following lower abdominal surgeries after giving spinal anaesthesia

We conducted eight surgeries in the age group between 8 months to 10 years for lower abdominal surgeries. After discussing in detail and taking written informed parental consent, we planned for the procedure. EMLA cream was applied at the L4-L5 region one hour before the procedure and the dressing was done using transparent adhesive plaster.

After securing IV access, intravenous (IV) glycopyrrolate at 10 microgram per kg was administered. This was followed by IV Ketamine 1.5mg per kg bolus and infusion propofol at the rate of 75microgram per kg per minute using infusion pump.

All the patients were given intrathecal bupivacaine at the dose of 0.08ml per kg of 0.5% Bupivacaine (heavy) for 5 to 10 kg and 0.06ml per kg of 0.5% Bupivacaine (heavy) for more than 10 kg using 50mm spinal needle. Propofol infusion continued throughout the surgery. All the children were made in supine position and oxygen was administered by face mask at the rate of five liter per minute.

After the completion of surgery and dressing done, under strict asepsis, using ultrasound machine, 0.5ml per kg of solution containing 0.25% bupivacaine was administered with the help of block needle between internal oblique and transversus abdominis muscle.

After administering the drug for TAP block, infusion propofol was stopped and the child was made to recover from the sedation. After shifting to PACU, child was observed for 30 minutes for any signs of toxicity like decreased heart rate, tingling, irritability and seizure.

Child was then shifted to ward and observed every thirty minutes for the next 24 hours vital parameters and for analgesic requirements.

FLACC score was then observed for next 24 hours at 4 hour interval.

AP4-2

Postoperative Sedation and Analgesia in Pediatric Cardiac Surgery

Virtual

AP4-3

Erector Spinae Plane Block with Ropivacaine 0.2% in Children - A Case Series, Single Center Experience in Tertiary Pediatric Center in Malaysia

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Background & Purpose: Erector spinae plane block (ESPB) has been first described in 2016 by Forero et al as a modified interfascial plane block that used for patient with chronic neuropathic thoracic pain and was applied in the pediatric population for postoperative pain management as early as 2017. Most evidence on efficacy of ESPB as a postoperative analgesia mainly came from case report but very few trials were conducted. The purpose of this case series mainly to report few cases of variable age group with different type of surgeries that received ESPB in our center.

Case Description: Four ESPB related cases done postoperatively under general anesthesia with ultrasound guided were described. Standard dose of ropivacaine 0.2% 0.5mls/kg was used. 1st case was a 4.12kg 1.5 months old boy that underwent on table cholangiogram and Kasai procedure. Bilateral ESPB was performed at level of T6. He was supplemented with intravenous morphine intraoperative and postoperatively. His FLACC score was 2 immediately postoperative and 0 on post op D1 until D3. 2nd case was an 18.4kg 8 years old girl, who admitted for stoma closure. She received bilateral ESPB at level of T10 with adjunct clonidine 1.5mcg/kg. Her VAS was 0-1 immediately post operative until day 2 post operative. 3rd case was a 46.3kg 15 years old girl who underwent left thoracotomy. She received left ESPB at level of T5. She was supplemented with morphine and intercostal nerve block intraoperatively. PCA morphine postoperatively. Her VAS was 2-4 immediately postoperative but reduced to 0-2 on D2 postoperative. She also received an oral analgesia. The last case was a 32.1kg 13 years old girl. She underwent left thoracotomy and nodulectomy. Left ESPB was performed at level of T5. She received intravenous morphine and intercostal nerve block intraoperatively, and PCA morphine postoperatively. Her VAS was 0-2 postoperative and reduced to 0-1 on D2 postoperative. She also supplemented with oral analgesia. No complication was observed during the block procedure.

Discussion: Based on these case series, its shown that ESPB can be performed not only in patient that undergoing thoracic surgery but also intraabdominal surgery. All of the case series proved that performing ESPB as part of multimodal analgesia can achieved good pain control postoperative in view of all patient had shown a FLACC or given VAS of 0-1 during immediate postoperative or postoperatively D2.

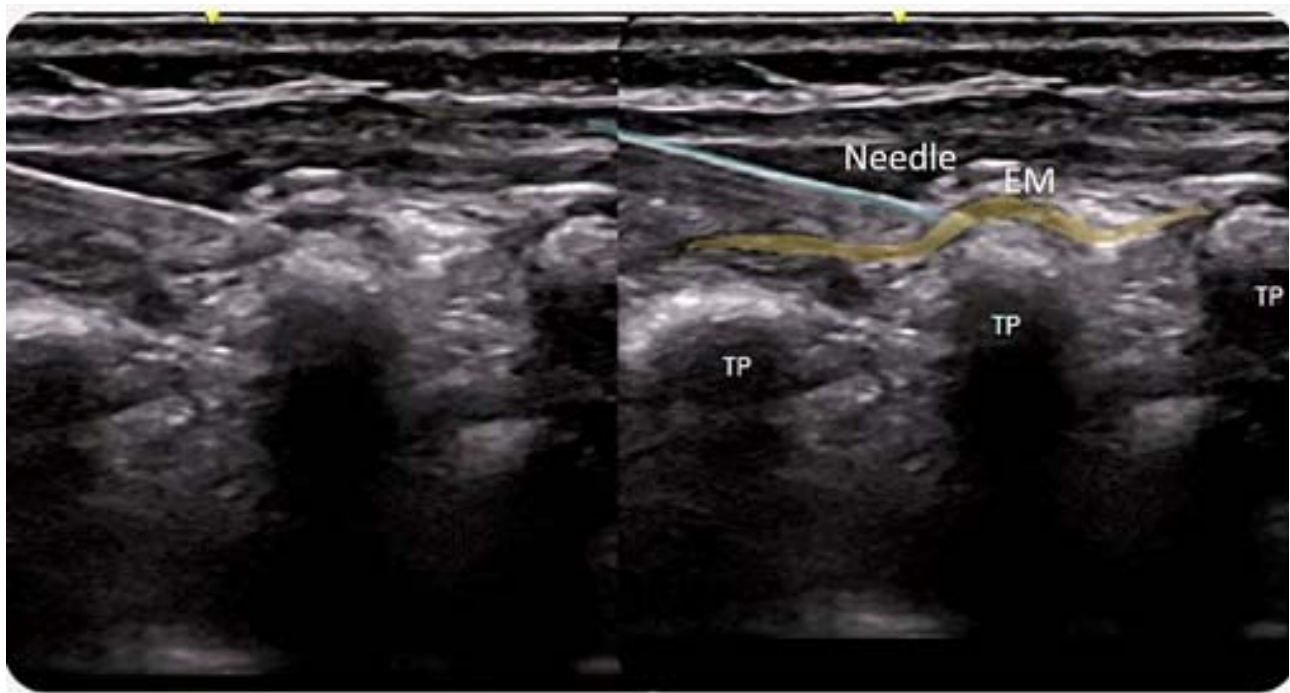


Figure 1: Ultrasound demonstrating needle to ESP at the level of T6 (cranial- caudal orientation)
 TP: transverse process
 EM: erector muscle

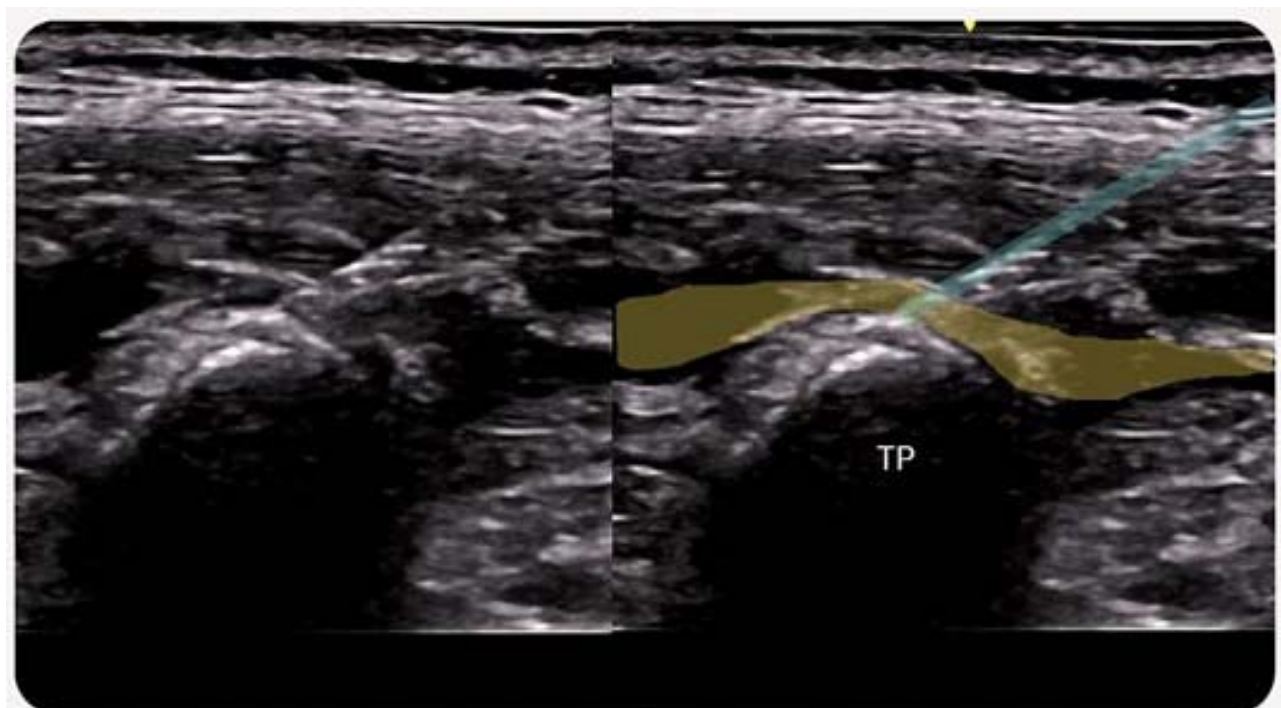


Figure 2: Ultrasound demonstrating needle to ESP at the level of T10 (cranial-
 caudal orientation)
 TP: transverse process

AP4-4

ESP Block for Anesthesia in a Pediatric Patient Who Underwent Diagnostic Laparoscopy after Foreign Body Injury

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Introduction: ESP block is a relatively new block characterized by the injection of local anesthetic between the erector spinae muscle and the transverse process. It is technically easier and safer in terms of central complications. (1) It is used in acute and chronic pain management as well as in various surgical procedures. Today, with the widespread use of USG, ESP block is used in many surgical procedures in both adult and pediatric patients for anesthesia and analgesia. (2) We aimed to share our pediatric patient who underwent diagnostic laparoscopy for trauma that we applied ESP block for anesthesia.

Case: A 11 years old 35 kg male patient with pencil penetration at lumbar region that planned diagnostic laparoscopy to investigate penetrating posterior abdominal injury. ESP block was applied after sedation with 0,5 mg/kg ketamine and 0,1 mg/kg midazolam. After hydrodissection (1 ml %0,9 NaCl), local anesthetic solution which contains 10 ml 0.5% bupivacaine and 15 ml SF were injected between the transvers process and erector spinae muscle. Then, spread of the solution in this plane was observed. Nonpenetrant trauma was confirmed laparoscopically. Then foreign body was removed and surgery was terminated. Patient was followed up with VAS score and recorded at 0.-30 min-1-2-4-6 hours postoperatively. His VAS scores were 0-3.

Discussion: There is little data about ESP block and using as an anesthesia technique in pediatric patients is quite limited in the literature. We provided peroperative anesthesia and postoperative analgesia control effectively in our pediatric patient who underwent laparoscopic abdominal surgery. We believe that US guided ESP block can be safely performed for peroperatively in some surgeries and decreased the postoperative pain related complications.

AP4-5

Epidural Analgesia in Major Paediatric Oncosurgeries: A Review of Safety Profile and Practices

Withdrawn

AP4-6

Analgesic Efficacy and Safety of Ultrasound-guided Erector Spinae Plane Block in Pediatric Patients Undergoing Surgery: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

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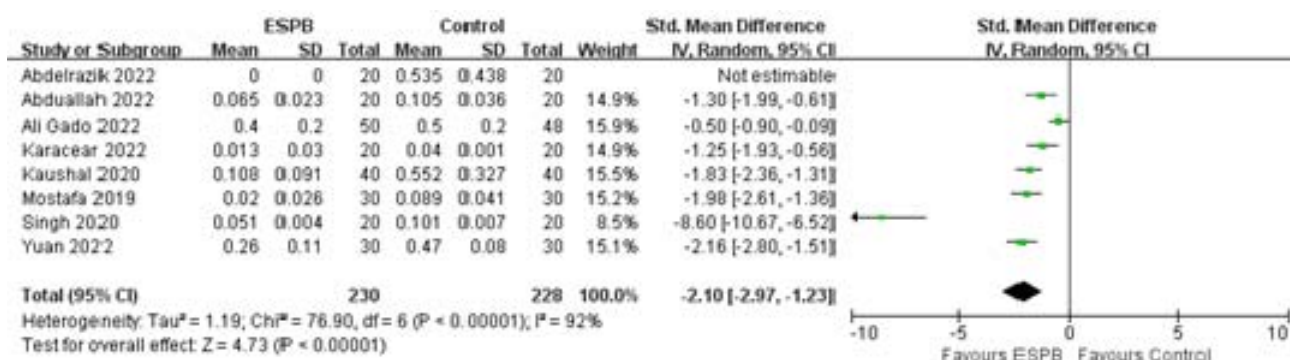
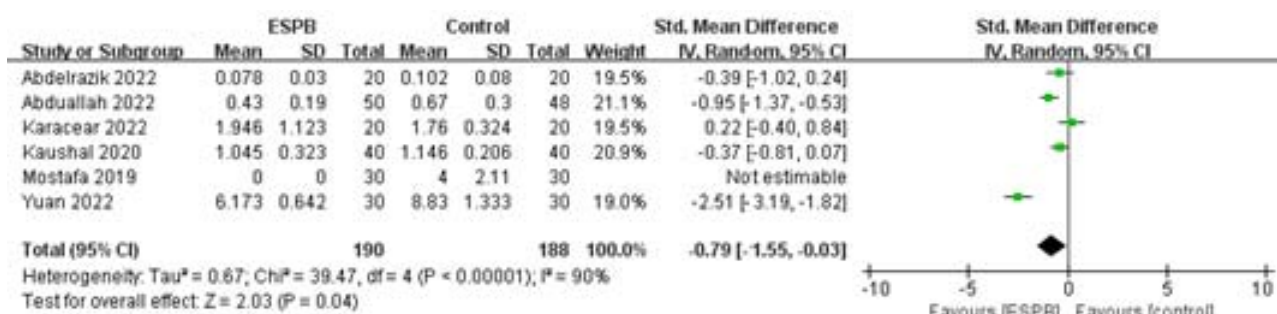
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Introduction: Ultrasound-guided erector spinae plane block (ESPB) has gained popularity for perioperative analgesia in adults undergoing various surgeries. But, its efficacy and safety in pediatric patients remain unclear. This review aimed to investigate the analgesic effect and safety of ultrasound-guided ESPB in pediatric patients undergoing surgery under general anesthesia through a meta-analysis of randomized controlled trials (RCTs) reported so far.

Methods: We searched the databases including PubMed, EMBASE, the Cochrane Library, Web of Science etc. for published eligible RCTs comparing ESPB with control (no block/sham block) in pediatric patients undergoing surgery from inception to March 2023. The analgesic efficacy outcomes were intraoperative opioid (i.v. morphine milligram equivalents) consumption, time to first rescue analgesic requirement, number of patients who required rescue analgesic, postoperative cumulative opioid requirement up to 24 h, the pain scores using the FLACC (Face, Legs, Activity, Cry, Consolability) scale for 24 h after surgery, and incidences of postanesthetic adverse events including bradycardia, hypotension, and postoperative vomiting (POV) were considered as safety outcomes.

Results: Data from 9 studies involving 501 pediatric patients were included. Compared to the control, ESPB significantly reduced the intraoperative opioid consumption and postoperative cumulative opioid requirement up to 24 h [standardized mean difference (SMD) = -0.79; 95% confidence interval (CI), -1.55 to -0.03, and SMD = -2.10; 95% CI, -2.97 to -1.23, respectively; Fig. 1 & 2] and significantly lowered the pain scores at 2, 6, 24 h after surgery. ESPB significantly prolonged the time to first rescue analgesic requirement and decreased the number of patients who required rescue analgesic. However, considerable heterogeneity in the outcomes was observed. As for safety outcomes, ESPB significantly decreased the incidence of POV compared to the control, while incidences of bradycardia and hypotension were comparable.

Conclusions: ESPB effectively and safely provided intraoperative and postoperative analgesia resulting in lower opioid requirement and pain scores in postoperative period up to 24 h with decreased POV in pediatric patients undergoing surgery under general anesthesia compared to the control. However, further studies are needed, considering the small number of studies included and the high heterogeneity of some efficacy outcomes.



AP4-7

Prediction of Effect and Complications of PCA in Children Undergoing Urologic Surgery

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Purpose: Postoperative pain is common in children, and the proper treatment of postoperative pain can be a challenge for physicians. This is a retrospective study investigating the effects and complications of patient-controlled analgesia (PCA) in children undergoing pediatric urology surgeries.

Method: Medical records of children who received intravenous PCA following urology surgery in a single tertiary hospital were analyzed. Data on the patient's gender, age, height, weight, medical history, surgical method, type of anesthesia, dosage of PCA, postoperative pain, additive analgesics and postoperative complications were collected. Machine learning-based predictive models were constructed to explore demographic, anesthetic and surgical attributes in order to predict post-operative pain and complications of PCA.

Results: The statistical analysis included data from 3,544 children. Random Forest model (AUC:0.79, ACC:0.83) and Glmnet Ridge model (AUC:0.84, ACC:0.86) were suitable for predicting moderate post-operative pain for 6-24 hours and 24-48 hours after surgery, respectively. The attributes used to predict moderate post-operative pain were previous post-operative pain score, anesthesia time, whether regional block was done, and age. XGBoost model (AUC:0.71, ACC:0.74) and Glmnet Ridge model (AUC:0.71, ACC:0.82) were chosen to predict complications of PCA for 6-24 hours and 24-48 hours after surgery, respectively. Attributes for predicting complications of PCA included age, motion sickness, total opioid dose, and anesthetic time.

Conclusion: In this retrospective study, machine learning-based models and attributes were proposed to predict moderate post-operative pain and complications of PCA in children undergoing urologic surgeries, which could contribute to improve postoperative pain management in children.



Day 2_Room D

Abstract Presentation 1 (Virtual)

Chair(s): Sooyoung Cho (Korea)
Hee Young Kim (Korea)

V1-1

“Know It to Deal with It”- Neonatal Airway Management with a Large Sincipital Encephalocele

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Background: Encephalocele is a rare birth defect of the neural tube that affects the brain with incidence of about 10-20% of all the cranial dysraphism. We here present a neonate with a huge frontonasal encephalocele planned for surgical excision.

Case Description: A 29 days old male, weighing 3 kg, admitted with a large frontonasal swelling for excision. MRI brain revealed a midline round to oval shaped bony defect of 2.2 cm in the frontal region, with herniation of brain tissue and CSF filled spaces. A diagnosis of sincipital frontonasal encephalocele was made by the neurosurgeons. His birth history was uneventful. The mass was present since birth and increased gradually (Fig. a). This was an obvious expected difficult mask ventilation case. Our general anesthetic plan was to go ahead with graded sevoflurane induction using I-gel size 1 for assisted ventilation, while an assistant held the mass. Para-oxygenation was done with nasal prongs. Our general anesthetic plan was to go ahead with graded sevoflurane induction using inverted RBS mask, while an assistant held the mass in supine position (Fig. b). Inj. glycopyrolate 15 mcg and Inj. ketamine 3 mg were given to help insert size #1 I-gel. After appropriate depth of anesthesia using I-gel for delivery of gases, a check video-laryngoscopy with Miller blade size 0 revealed CL grade 2b. The trachea was then intubated with 3.0 uncuffed PVC endotracheal tube. Mechanical ventilation was instituted and maintained anesthesia with oxygen/ air, isoflurane and intermittent doses of atracurium. Intraoperative course was uneventful and patient trachea was extubated afterwards.

Discussion: Reporting of problems faced in anterior encephaloceles is very sparse. In our case, we planned to use a size #0 RBS mask in an inverted position for proper seal and adequate bag & mask ventilation. But it could not help for maintaining adequate depth, so we used I-gel instead. As this was an anticipated difficult airway, Inj. succinylcholine 6 mg, appropriate size oral airway, mask, SGDs, FOB 2.8 mm size was kept ready. Besides difficult airway, perioperative concerns like CSF leak, hemorrhage, raised ICP, seizures and brainstem compression should be kept in mind. We conclude that a difficult airway cart should always be ready with airway management plans.

Reference: 1) Dhirawani RB, Gupta R, Pathak S, Lalwani G. Frontoethmoidal encephalocele: Case report and review on management. Ann Maxillofac Surg 2014;4:195-7



V1-2

Nasotracheal Intubation Guided by the Esophageal Temperature Probe in Children

Withdrawn

Risk Factors for Failed First Attempt of Intubation in Pediatric Patients: Preliminary Results of a Prospective Observational Study

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Background: Unpredicted difficult intubation in children remains frequent. The aim of this study was to investigate risk factors for failed first attempt of intubation in children

Methods: This is a prospective observational study including newborns, infants, and children under 5 years old undergoing general anesthesia with tracheal intubation. We collected data about demographic parameters, anesthesia protocol, facial dysmorphism, and circumstances of anesthesia. Patients were divided into two groups. Group 1: included patients whose intubation failed in the first attempt. Group 2 included patients with easy intubation and who were intubated from the first laryngoscopy. After statistical comparison between the two groups, a univariable logistic regression was performed to investigate predictors for failed first intubation in children.

Results: in this study we included 65 patients. The incidence of failed first attempt of intubation was 7.7% and no failed intubation was noted. Demographic and anesthesia parameters were comparable between the two groups. The main risk factors for failed first intubation were premature neonates with [OR=9.7; 2.7-35.1], emergency [OR=5.2; 1.6-16.3], surgery after midnight [OR=14.6; 1.5-135], and syndromic dysmorphism [OR=66; 7.5-58].

Conclusions: It seems that syndromic dysmorphism remains the main risk factor for difficult intubation in children. However, particular cautions should be given for premature newborns and emergent surgeries.

V1-4

Management of a Rapidly Growing Sublingual Congenital Ranula: A Case Report

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Ahlem Bouzid¹, Hichem Cheikhrouhou²

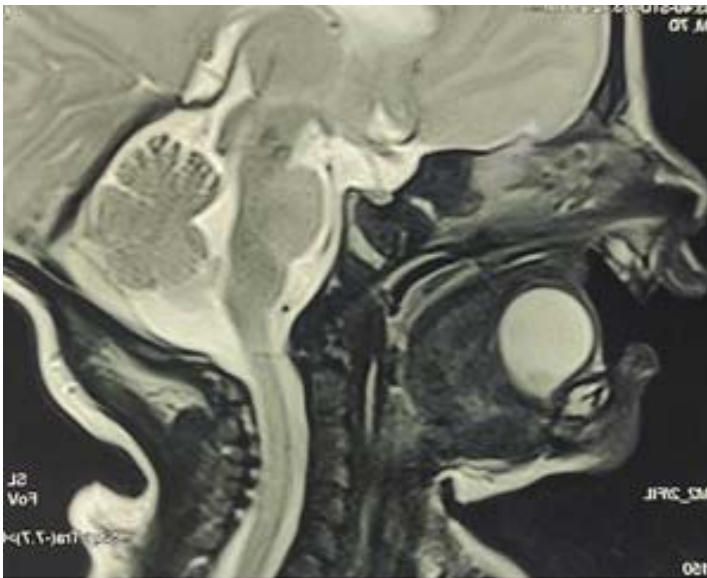
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Background: Congenital ranula is a rare sublingual mucous extravasation pseudocyst. It can remain asymptomatic for a long period of time. However, we report a case of a rapidly growing ranula that became obstructive within two weeks. We also describe the original airway and anesthetic management that allowed the total excision of the cyst.

Case Presentation: We report the case of a newborn born at 37 weeks gestation who had a small swelling under the tongue. Two weeks later, the patient was having feeding and breathing difficulties, as well as losing weight. We chose cyst puncture and drainage after two failed intubation attempts, which allowed for better conditions for a successful oral intubation. The cyst excision was done under deep general anesthesia using a transoral approach. The histologic examination showed a congenital ranula.

Conclusion: Congenital ranula can grow rapidly, causing the obstruction of the airway. It seems that the puncture and drainage of the cyst prior to the intubation may facilitate the airway management. Furthermore, radical surgical treatment remains the best solution to reduce the risk of recurrence.



V1-5

An Innovative Technique to Deflate and Reinflate the Tracheostomy Tube to Facilitate Ventilation During Tracheal Resection and Reconstruction Surgeries

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Background: Tracheal resection and reconstruction (TRR) is one of the most challenging surgeries for anesthesiologists because of compromised airway. Advances in surgical, anesthetic and airway management have improved the outcomes. Plan for ventilation during the “open airway phase” where the trachea is mobilized by the surgeon is crucial. The conventional approach of distal tracheal intubation for cross field ventilation followed by apnea-ventilation-apnea technique requires good coordination between surgeons and anesthetist.

Case Description: A young girl sustained accidental strangulation injury due to scarf entangled around her neck while pillion riding on a bike. This led to blunt airway trauma for which she was intubated and later tracheostomized owing to failed extubation. Multiple attempts at decannulation failed and she was found to have tracheal stenosis for which TRR was planned. After thorough pre-operative work up, assessment of the airway was done with flexible bronchoscope and surgery proceeded. After intravenous induction, tracheostomy tube was exchanged with 5 sized cuffed flexometallic tube. An uncuffed flexometallic tube of the same size was passed nasally and placed proximal to the stenotic segment. During open airway phase anesthesia was maintained with TIVA (dexmedetomidine and propofol infusion) allowing patient to breathe spontaneously. This gave longer periods of tubeless surgical field without significant drop in saturation.

Discussion: For TRR surgeries, the distal tracheal tube needs to be deflated and retracted for surgical exposure very often which can be cumbersome and time consuming. To facilitate smooth manipulation of the cuff we attached a regular pressure monitoring line with luer lock to the pilot balloon of the distal tracheal tube which in turn was connected to a cuff pressure gauge monitor. This allowed easy and quick deflation and reinflation away from the surgical field without disturbing the surgical team. Later the nasal tube was introduced into the reconstructed airway. Patient was shifted to intensive care unit for elective ventilation and extubated on 3rd post operative day. She was discharged with advice of bi-level positive airway pressure at night. Anesthesia for airway procedures is among the most technically challenging task for the entire team and new modifications such as these offer potential advantages. We wish to share our experience for the benefit of all.



V1-6

Airway Management of a Congenital Teratoma with a Cleft Palate: An Original Case Report

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Background: Airway management in neonates is difficult because the risk of rapid hypoxia. It presents a challenge even for an experienced anesthesiologist. Oral tumors in neonates are very rare but they can seriously worsen the conditions of intubation. To surmount these difficulties, a special multidisciplinary approach and particular precautions are needed.

Case Presentation: We describe the airway management and precautions taken in the anesthesia for surgical removal of a rare case of congenital palate teratoma associated to a wide cleft palate in a 25 days old girl. Impossible intubation was predicted on the magnetic resonance imaging. The difficult airway management cart as well as an otorhinolaryngologist, skilled in performing emergency tracheostomy in a neonate was available. The patient was intubated by conventional laryngoscopy under sevoflurane inhalatory anaesthesia. To prevent post operative edema and bleeding, the patient received dexamethasone and he was extubated 24 hours after the end of the intervention.

Conclusion: This case illustrates that predicting difficult airway in a newborn by clinical evaluation and radiological exams allowed us to take necessary precautions for successful neonatal airways management.



Figure 1: Clinical appearance of palate teratoma associated with a cleft palate: tumor covered with fine downy skin protruding from the shelves of the cleft.

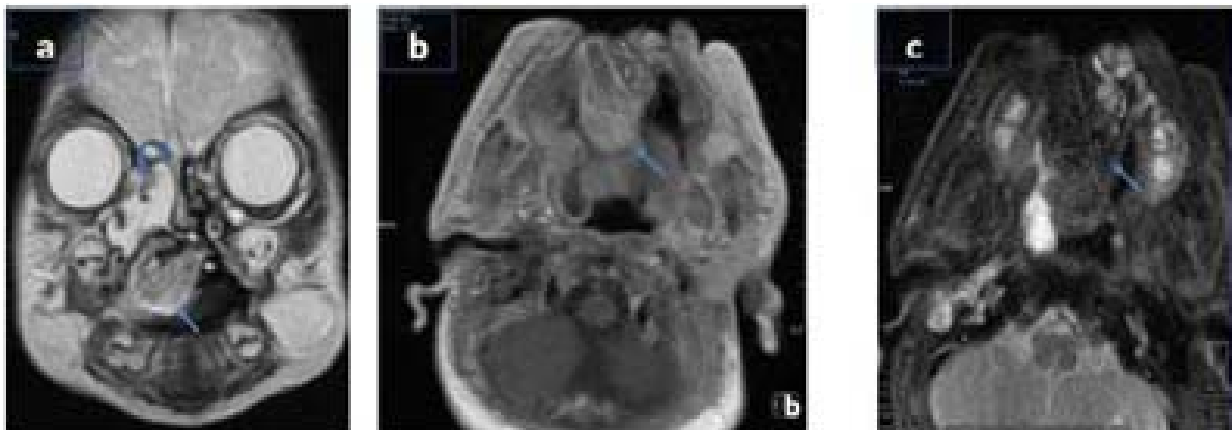


Figure 2 :

- a) MRI T2-weighted coronal image shows a lesion attached to the nasal septum between the two palate shelves with endobuccal extension. The lesion is heterogeneous and contains areas of hyperintense signalling (arrow). We note also retention of fluid within ethmoid cells upstream from the tumour (curved arrow).
- (b) An axial T1-weighted image shows a hyper-intense heterogeneous encapsulated lesion measuring 3 cm approximately.
- (c) T2-weighted fat suppressed axial image shows loss of signal intensity on the tumoral lesion which suggests the presence of macroscopic fat (arrow).

V1-7

Airway Management of Congenital Pulmonary Airway Malformation Resection in an Infant in Resource Limited Setting: A Case Report

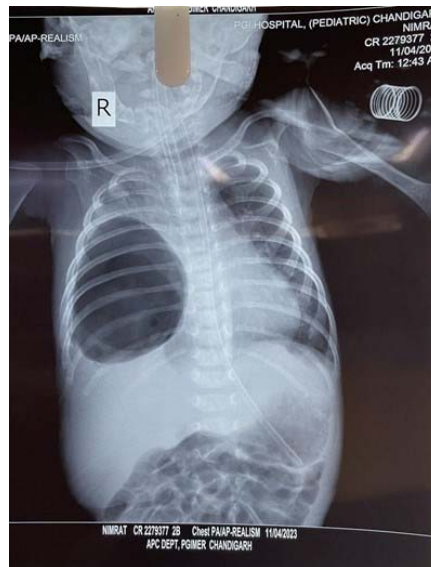
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Background: Congenital Pulmonary Airway Malformation (CPAM) is a rare developmental anomaly of lower respiratory tract. Incidence of 1/20,000-1/30,000 live births. It does not participate in gas exchange, communicates with bronchial tree and receives blood supply from pulmonary circulation. Positive pressure ventilation causes cystic dilatation of affected airways with risk of tension pneumothorax. CPAM may contain fluid, increasing risk of spillage and flooding of airway intraoperatively. We report management of an infant in resource limited setting with CPAM who had risk of pneumothorax and airway flooding.

Case Discussion: 1 month-old female infant weighing 2.5 kilograms, presented with fever and respiratory distress for 20 days. The baby was referred to our institution on day-46 of life for worsening respiratory distress. She was intubated in emergency. Chest x-ray (Figure 1) and computed tomography-scan (Figure 2) showed middle lobe CPAM with air-fluid level. Posted for lobectomy under general anesthesia. On pre-anaesthetic evaluation, right lung obliterated by large cyst and had hardly any tidal exchange. The consensus decision (by surgery and anaesthesia) was to place ultrasound-guided intercostal chest drain (ICD) to drain fluid and relieve compression of lung tissues preoperatively. Infant was taken up for surgery after 48 hours of stabilization on ICD. It was ideal to place right sided bronchial blocker (BB) or left sided endobronchial intubation, which was not feasible due to non-availability of 2.2 or 2.8 mm flexible bronchoscope. The following precautions were taken: Muscle relaxant avoided till pleural opening, ICD not clamped fearing risk of pneumothorax, and on thoracotomy bronchial communication to cyst was blocked with gauze till clamping of bronchus was achieved. Intermittent endotracheal tube suction was done to prevent its blockage with blood. To avoid operation theatre pollution from inhalation agent, propofol infusion was instituted.

Discussion: CPAM resection necessitate one-lung ventilation (OLV) which is achieved by Double lumen tube (DLT), BB and endobronchial intubation. DLT for infants are not available. Left endobronchial intubation needs FOB guidance, which is challenging in resource-poor setting and leads to ventilation-perfusion mismatch. In our case scenario, the risk of placing BB was more than benefit. This case will give an alternate idea for airway management in such cases in resource limited setting.



V1-8

Pediatric Airway Management in Undiagnosed Congenital Subglottic Stenosis Undergoing Congenital Cardiac Surgery

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The pediatric unanticipated difficult airway in cases of subglottic stenosis is always a challenge. Children form a specific group of patients as there are significant differences in both anatomy and physiology. Here, we have presented a case managed according to pediatric difficult intubation protocols where tracheostomy was used as a secondary intubation plan successfully.

A 6-month-old female child weighing 8 kg underwent congenital cardiac surgery for the repairment of ASD-VSD closure. Preoperatively airway examination revealed no abnormalities. Mouth opening was adequate for her age. Preoperatively systemic examination and all relevant investigations were normal. The Copur index was 6 which revealed easy normal intubation. On the day of surgery, premedication was done with oral midazolam (0.5 mg/kg). Anesthesia induction was done with fentanyl 1.5 µg/kg and a midazolam 0.25 mg/kg iv. Adequacy of mask ventilation was established following which injection of atracurium 0.5 mg/kg was administered. Although mask ventilation was adequate, direct laryngoscopy revealed Cormack-Lehane Grade 4. Four attempts with 2 specialized pediatric anesthesiologists to intubate with cuffed endotracheal tube sizes 4.5, 4.0, and 3.5 were unsuccessful. Each attempt was done after preoxygenation with 100% oxygen; hence, on no occasion, oxygen saturation went below 80%. Supraglottic airway, i-gel®, size 2 can't be inserted as a rescue device. Since mask ventilation can be established successfully tracheostomy decision was taken. The cardiovascular surgeon has established a surgical tracheostomy successfully within 8 minutes.

If the operation was not urgent, the case can be postponed and both surgical and non-surgical treatment methods could be recommended.

After operation, she was taken to the intensive care unit (ICU). Fiberoptic bronchoscopy staged it as a Grade 3 subglottic stenosis. On the third day of ICU, she was discharged from the service without any problem.

Many patients with difficult airways can be identified before induction of anesthesia or sedation. These patients should be cared for only in a tertiary care facility with qualified caregivers. Current practice guidelines and recommendations should be reviewed and practiced so that individuals and institutions can be ready to act quickly when problematic airway scenarios arise. Needed equipment should be readily available in a portable difficult airway cart.



Day 2_Room D

Abstract Presentation 2 (Virtual)

Chair(s): Ji-Hyun Lee (Korea)

Ye Yun Phang (Malaysia)

V2-1

Anesthesia Management of Left Pulmonary Artery Sling: LPA Reimplantation Without Cardiopulmonary Bypass

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Background: Left Pulmonary Artery Sling (LPAS) is a rare vascular anomaly. The surgical technique is generally carried out with a median sternotomy approach using a Cardiopulmonary Bypass (CPB) to release the slinging pulmonary artery and repair the tracheal stenosis. In this case, we will discuss the anesthetic management of LPA reimplantation without using CPB to improve the understanding and provide an overview for practitioners in managing patients with this rare vascular anomaly.

Case Description: The patient was a 10-month-old baby complaining of shortness of breath since he was 4 months old. Based on the results of cardiac MSCT, the patient was diagnosed with LPAS. The patient was planned for LPAS repair surgery without using CPB. The patient underwent general anesthesia. The surgery was performed by releasing the left pulmonary artery (LPA) and reimplanting it into the main pulmonary artery (MPA). When the LPA was clamped to cut and release the sling, there was a decrease in blood pressure and an increase in end-tidal CO₂ (EtCO₂) to 70 mmHg. After the reimplantation process was completed, the LPA and right pulmonary artery (RPA) showed confluence, and the end-tidal returned to normal at 36 mmHg. Tracheoplasty procedure was not performed on the patient. After the operation, the patient was treated in the intensive care Unit (ICU) for 10 days.

Discussion: LPAS is one of the rare congenital heart defects caused by abnormalities of left pulmonary artery grew from the right pulmonary artery and ran posteriorly between the trachea and esophagus towards the left lung. Diagnosis of LPAS can be established by examining a multi-slice CT scan to look for defects in the LPA. Generally, surgery for correction of LPAS is performed using a median sternotomy approach with CPB. The surgical process consists of releasing the sling LPA and reimplanting the new LPA into the MPA. In this patient, corrective surgery was performed through median sternotomy without CPB. Intraoperatively, there was a decrease in blood pressure due to decreased preload and increased EtCO₂ due to increased dead space which was successfully overcome by administering fluids, inotropes and increasing alveolar ventilation in ventilator settings. When the LPA was successfully released and reimplanted, hemodynamic and EtCO₂ returned to normal. Postoperatively, the patient experienced Ventilator Acquired Pneumonia (VAP) and we administered antibiotics according to the culture results.



Figure 1. MSCT (Multi-slice Computerized Tomography) Cardiac shows that the LPA (Left Pulmonary Artery) is narrowing due to the LPA sling.

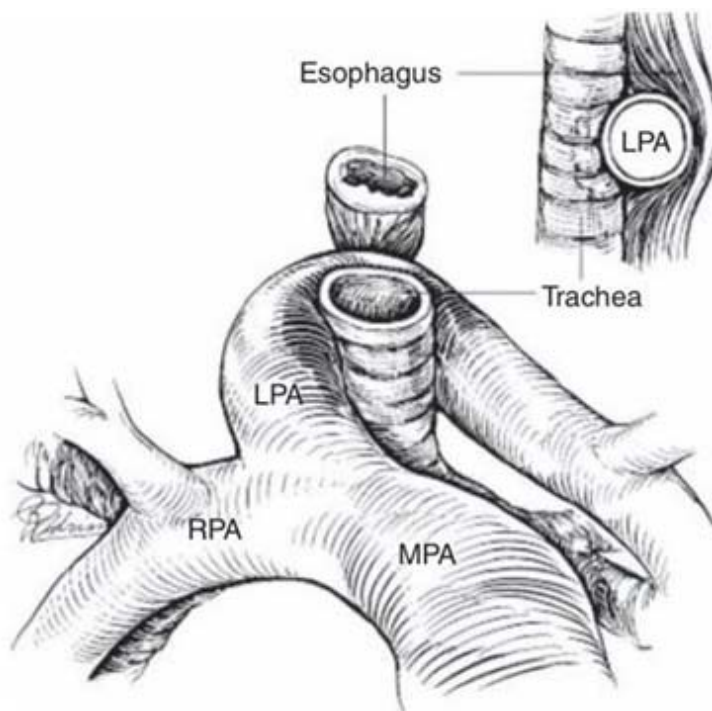


Figure 2. Left Pulmonary Artery Sling (LPAS). L, Left; R, Right; M, Main; PA, Pulmonary Artery. Fig 2 Shows a lateral view of anterior compression of the esophagus and posterior compression of the trachea.

V2-2

Fast Track Extubation in Severe Scoliosis with Cor Pulmonale: The Role of Non Invasive Ventilation

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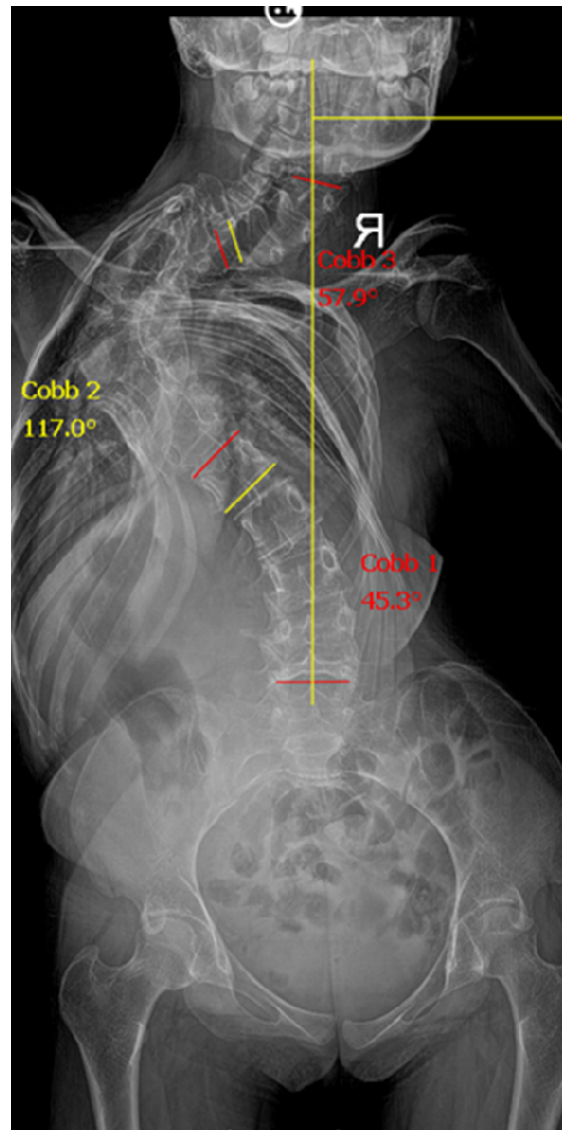
Background: Advanced congenital scoliosis causes cardiorespiratory dysfunction resulting in severely restricted lung disease and cor-pulmonale. Corrective surgery curbs decline in cardiorespiratory function. Intraoperative arrhythmia, myocardial ischemia due to right heart failure, neuromonitoring and blood loss makes anesthetic management challenging. The severely restricted lung function makes them candidates for prolonged postoperative mechanical ventilation.

Case Description: A 16-year-old female presented with severe congenital thoracolumbar scoliosis, Cobb's angle 117°, dyspnea NYHA grade 3, breath holding time 10s and room air saturation (SPO₂) 62%.

Investigations: PFT-FEV₁-24%, FVC-26%, ECHO-right heart dysfunction; CT Angiography: severe pulmonary artery hypertension (PAH), Room air ABG-Type 1 respiratory failure. A staged scoliosis correction was planned. Sildenafil was initiated preoperatively. Standard ASA monitors and invasive monitoring were established. Intubation was done after adequate preoxygenation. TIVA technique with propofol 100mcg/kg/minute, fentanyl 1mcg/kg/hour and dexmedetomidine 0.7mcg/kg/hour was used to facilitate SSEP and MEP monitoring. Temperature, urine output, entropy, serial ABG were monitored. CVP trends served as surrogate for right heart function. Hemodynamic fluctuations and factors worsening PAH, RV dysfunction were avoided. 100ml blood loss was replaced with plasmalyte. At the end of surgery, once spontaneous respiration resumed, patient was shifted to PACU on pressure support mode. She was extubated after 3 hours and immediately switched to Non Invasive Ventilation (NIV). Postoperative analgesia included IV paracetamol 300 mg and IV tramadol 30 mg, avoiding opioid infusion.

Post Operative Course: Following the first 24 hours on NIV, patient was weaned to night-time only BiPAP over the next 72 hours and discharged home on the same. Hypercapnia (permissive) on ABG was accepted since patient had no tachypnea. On the 10th day follow up, room air SPO₂ improved to 91% and ECHO showed mild PAH with good RV/LV function. By the third week PFT showed improved values.

Discussion: Transition to NIV immediately post extubation in patients with severe restrictive lung disease avoids complications of mechanical ventilation like ventilator associated pneumonia and prolonged hospital stay. Dexmedetomidine infusion is safely tolerated in cor pulmonale, decreases perioperative opioid consumption and facilitates early extubation.



Parameters	PRE-OP	INTRA-OP	1 HOUR POST NIV	POST-OP Day 1	POST-OP Day 2	POST-OP Day 10
ABG						
pH	7.45	7.52	7.29	7.32	7.33	7.43
PaO ₂	45.4	352	153	93.4	121	31.7
PaCO ₂	46.4	37.9	59.7	67.8	64.3	51.4
SPO ₂	62% RA	99%	98%	98%	99%	91% RA
PFT						
FEV ₁	24%					33%
FVC	26%					31%
MMEF	23%					24%

V2-3

A Single Institute Retrospective Audit of the Anaesthesia Management in Children Undergoing Epilepsy Surgery

Vedhika Shanker¹, Nandini Dave²

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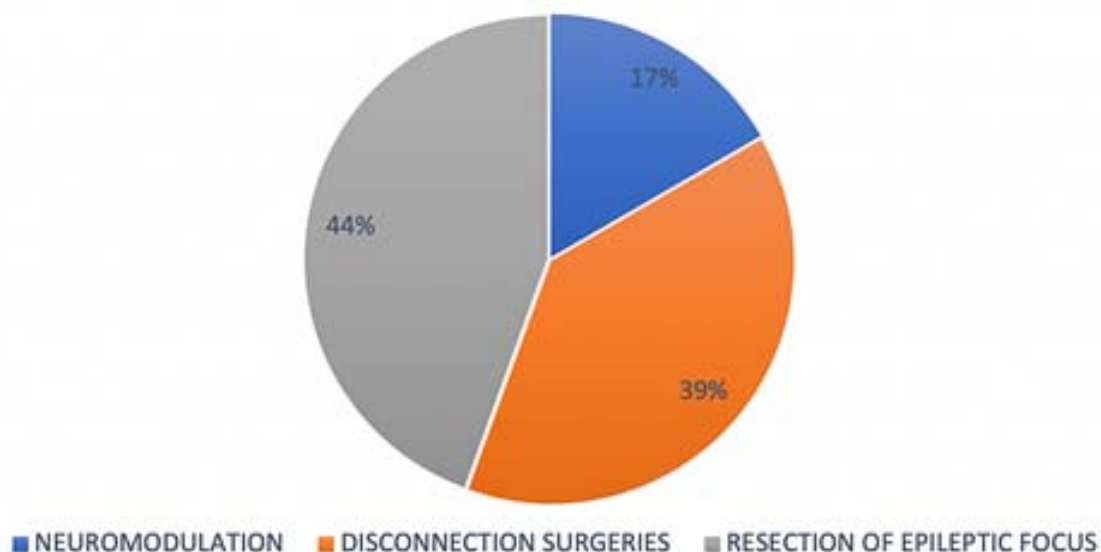
Background: Once patients meet the criteria for epilepsy surgery, a multidisciplinary team involving the neurologist, neurosurgeon, radiologist, anaesthesiologist and, often, a psychologist form the collaborative team dealing with their perioperative care. Anaesthesiology involvement begins from the investigative work up itself - MRI, SPECT or electrocorticography (ECoG) and deep electrode placement. Patients are always on long term anti-epileptic therapy and are screened for any side effects. The challenge in the intraoperative management lies in the dynamic alteration of our anaesthesia management, often multiple times within a single case, as the type of neuro-monitoring being used changes from time to time. ECoG recordings are central to the surgical process and since our anaesthesia medications interfere with the readings we are required to modify our plan. The administration of a scalp block attenuates our anaesthetic requirement greatly and has been used in many of our cases. We may even be required to produce pharmacocoactivation in order to better map the epileptogenic focus.

Methods: We audited our institutions' patients who underwent epilepsy surgery. The study design is a retrospective audit from February 2022 - 2023.

Results: A total of 18 patients had undergone epilepsy surgery in the study period. The surgeries performed were 3 neuromodulation, 8 disconnections and 9 epileptic focus resections. We performed a preoperative TEG[®] in all our patients, and none of the patients showed an abnormal Maximum amplitude value. Neuromonitoring was used in 10 cases, all of whom received a TIVA based anaesthetic with BIS monitoring. A scalp block was administered in 8 of the 18 patients. 1 patient underwent an awake craniotomy and our youngest patient was a 6 month old with tuberous sclerosis. All except the neuromodulation cases required invasive arterial and central venous lines and monitoring. Of the 18, 2 patients were electively ventilated post operatively, the rest were extubated on table, and all shifted to the PICU.

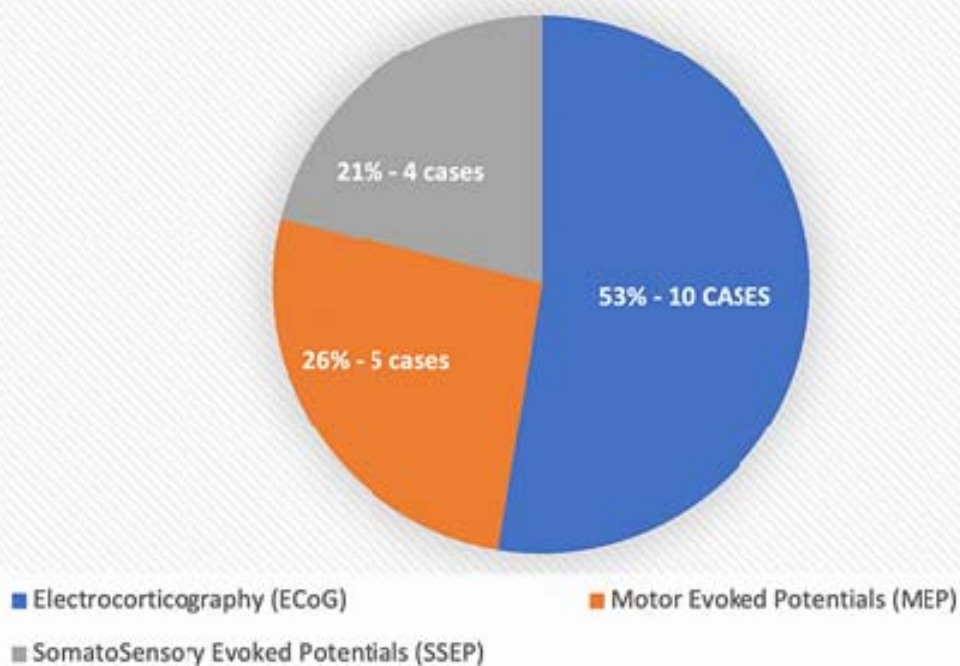
Conclusions: This paper outlines the role of the anaesthesiologist in children undergoing epilepsy surgery. The preoperative radiological workup, anaesthesia implications of AEDs, intraoperative anaesthesia techniques to facilitate neuromonitoring and identification of the epileptogenic focus, and common perioperative problems are discussed. A protocolized approach to management & team coordination are keys to a successful outcome.

SURGERIES PERFORMED



USAGE OF NEUROMONITORING

(6 cases required the use of multiple neuromonitoring techniques)



V2-4

Anaesthesia Management in a Rare Skeletal Dysplasia - Desbuquois Syndrome: A Case Report

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Background: This report elucidates the management of a 21 month old patient - weighing 5kg with a height of 68cm - with Desbuquois syndrome undergoing bilateral knee deformity correction. Desbuquois syndrome has an incidence of less than 1/1,000,000 live births. The disorder was first described in 1966 and since then less than 50 cases have been reported, with wide heterogeneity in characteristics. Only 2 reports exist on the anaesthesia management in a pediatric patient. It has a reported mortality of > 33%, attributed mostly to respiratory causes, with peak incidence of death being in infancy. Our child had characteristic features - flat face, micrognathia, hypoplastic abdominal musculature, bell-shaped thorax, hyperflexible joints, knee dislocation, clinodactyly, a short neck and dwarfism.

Case Description: Our pre anaesthetic evaluation revealed potential difficulties with obtaining intravenous access, positioning, difficult airway and difficulty in placing a regional block in view of anatomical distortions. We also expected to face respiratory insufficiency post anaesthesia. Our plan was an inhalational induction followed by airway management via an LMA, with endotracheal intubation being plan-B, followed by caudal analgesia, and post-operative ICU standby in case of respiratory insufficiency. The airway proved challenging; a 1.0 i-gel LMA did not provide adequate seal, following which two intubation attempts were needed - first with a 4.0 uncuffed ETT and the second successful one with a 3.5 uncuffed ETT, railroaded over a 8Fr FROVA. We postulate a subglottic narrowing as, by age, the child should have accommodated a 4.5 sized ETT, which, despite adequate visualisation of the glottis, could not be passed. The caudal block was also difficult, requiring two attempts by a senior anaesthetist. Post-procedure the child was extubated following full recovery from neuromuscular blockade.

Discussion: A literature review allowed us to surmise the general problems associated with this patient population, and even though anaesthesia related reports were only 3 in total, the general reviews helped us anticipate potential problems. This and a keen clinical judgement form the cornerstones of anaesthesia management in patients with rare illnesses. Additionally, Desbuquois syndrome patients could have a component of subglottic stenosis complicating their airway, and this needs further study, as we still do not know the full phenotypic expression of this disease.



V2-5

Perioperative Management of a Preterm Infant for Subgaleo-Ventricular Shunt

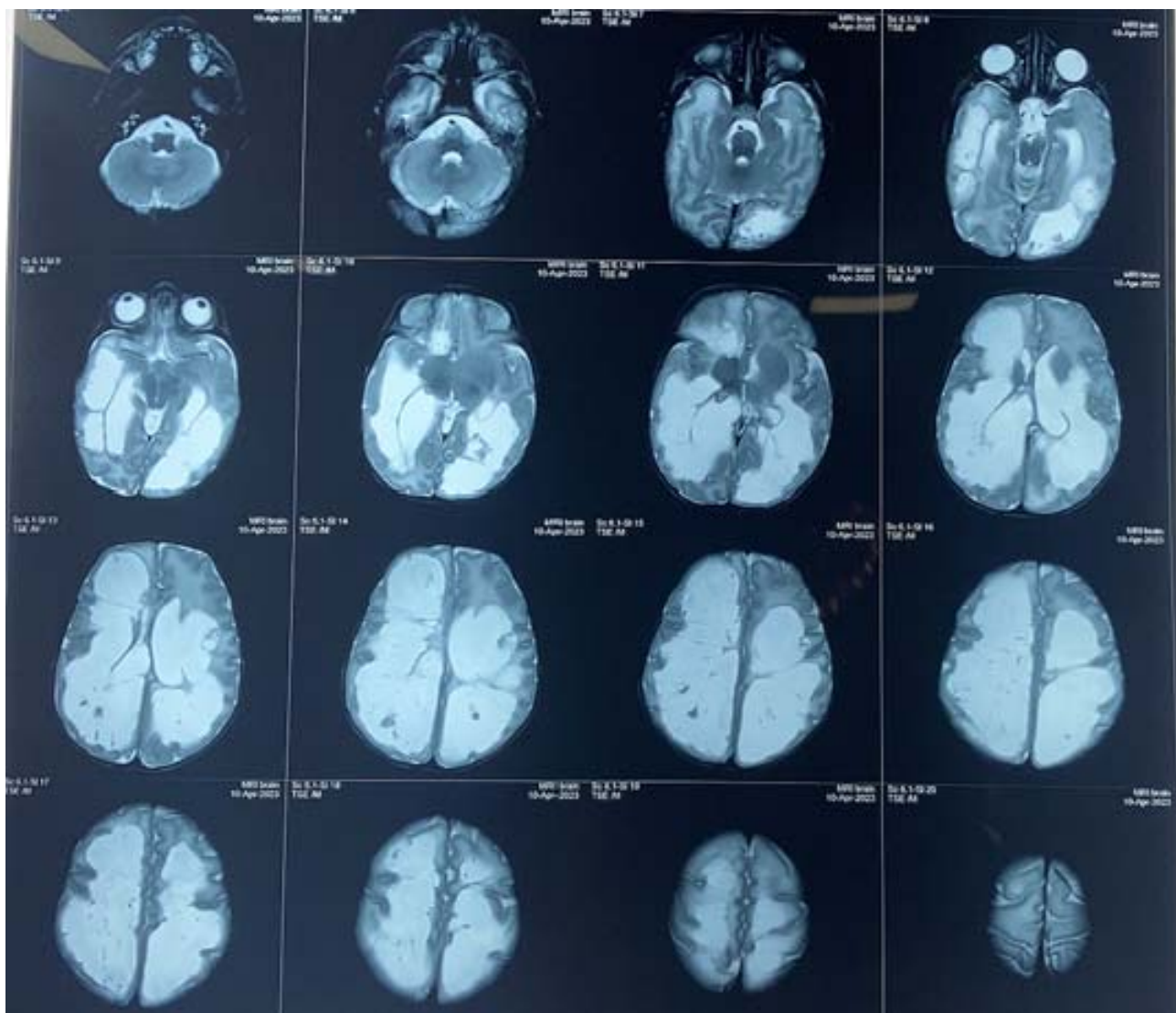
Archana Raichurkar, Suma S, HS Murthy

Department of Anaesthesiology, Manipal Hospital, Old airport road, Bangalore 560017

Background: Perioperative management of a hydrocephalitic preterm neonate is complex due to the raised intracranial pressure (ICP) and comorbidities related to prematurity. We report a 28 day old preterm baby (35 weeks post conceptional age) posted for subgaleo-ventricular shunt.

Case Description: A neonate with history of respiratory distress and necrotising enterocolitis with intermittent episodes of apnoea and desaturation on caffeine infusion presented to us for Subgaleo-ventricular shunt. Serial Neurosonography showed periventricular flare with increasing cystic areas bilaterally with aqueductal septum. The child weighed 1.83 kg was active but hypotonic with bulging anterior fontanelle. Packed red blood cell was transfused to increase the haemoglobin from 6 to 10g/dl. We intubated the baby in PICU considering the apnoea episodes. In OT standard monitoring was done. Anaesthesia was induced and maintained with oxygen, air and sevoflurane. Pressure control mode of ventilation was used to maintain ETCO₂ between 30 to 35 mmHg. FiO₂ was adjusted to keep saturation above 95%. Care was taken to keep baby warm. Surgery lasted for 40 minutes with negligible blood loss. Postoperatively the child was shifted to PICU and extubated after 2 hr. Ventriculoperitoneal shunt was planned for a later date.

Discussion: Subgaleo-ventricular shunt is a temporary measure to reduce the compression on brain tissue in preterm infants as they are not candidates for VP shunt due to reduced capacity of peritoneum to absorb CSF and increased susceptibility to infection due to the immature immune system. Hydrocephalous in these babies can be associated with congenital anomalies. Additionally, these babies can have problems of low birth weight, anemia, coagulopathy, jaundice, respiratory disease, and persistent fetal circulation. The anesthetic plan should take into consideration these factors. Airway management and positioning is challenging due to the macrocephaly and large occiput. Elevating the shoulder with a roll facilitates laryngoscopy. Measures should be taken to avoid increase in ICP. Anaesthetist should be alert to bradycardia, hypertension, and respiratory changes which may occur due to brainstem compression. Apnoea monitoring is important after extubation in addition to neurological monitoring and some babies may need respiratory support. Thus these babies can pose a multitude of challenges for the anaesthesiologist but one can tackle these issues with proper preparation.



V2-6

Ultrasound Assessment of Cricothyroid Membrane (CTM) in Children with Respect to Front of Neck Access - An Observational Study

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Background: "Cannot intubate, cannot ventilate" (CICV) is a rare, but life-threatening situation. Cricothyroidotomy is recommended for CICV scenario¹. The size of device for cricothyroidotomy is dependent on multiple factors². There is inadequate literature on age-wise anatomical considerations for cricothyroidotomy in children.

Methods: This is an observational study on 69 children (age > 6 months to 6 years) posted for any procedure under anesthesia. We would do an ultrasound evaluation of CTM after induction. The Primary outcome was to see the dimensions (height and width) of CTM, to see any Overlap of thyroid cartilage by hyoid bone, and presence of any vascular structures over CTM, the secondary outcomes are to see the usefulness of ultrasound, to describe the difficult nature of airway according to age.

Results: 69 children took part in this study, the average CTM height was 0.505 cm and width was 0.48 cm, we observed overlap of the hyoid bone in 4 cases (P value 0.017), all of them belonged to age group <12 months and we found vascular structures near CTM in 29 patients, and it took 139.53 seconds with an SD of 26.76 to do the scan. Demographics are included in Tables 1 & 2.

Conclusion: There is an association between age concerning height and width of CTM. The width of CTM is smaller than height in children <5 years of age which needs to be considered when planning cricothyroidotomy in this age group. Significant overlap of hyoid bone is seen in age < 1yr and also the average time taken to do the scan (154.6 seconds) in children less than 1 year of age is more when compared to other age groups. This helps in assessing the difficulty in cricothyroidotomy.

Anaesthetic Implications and Considerations in Children with Permanent Pacemaker for Non-Cardiac Surgery: A Report of 2 Cases

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Background: Complete heart block is a common complication after correction of congenital heart defects. Increasing number of paediatric patients with permanent pacemaker (PPM) are encountered by anaesthesiologists for non-cardiac surgery due to high survival rate. We report 2 toddlers with complete heart block on PPM anaesthetised for non-cardiac surgery.

Case Description: Table 1 summarized relevant history, anaesthesia and analgesia regime for both patients. General anaesthesia was tailored to surgical needs. Standard monitors were attached, 5 leads ECG with pacemaker detector was used to monitor pacing activities. After surgery, they were extubated and discharged to ward. No PICU admission required.

Discussion: A child with PPM needs a thorough preoperative evaluation and multidisciplinary plans. Primary focus is to assess patient's cardiovascular status based on history, examination and investigations (ECG, CXR - Figure 1 & ECHO). Followed by interrogation of the PPM (type, mode, parameters & battery lifespan). Patient's dependency on PPM has to be established and factors affecting myocardial pacing threshold (electrolytes & acid-base abnormalities) must be optimised. Anaesthesiologist must understand physiology and pharmacology effects of anaesthesia towards paediatric cardiovascular system. Anaesthetics (propofol, dexmedetomidine, remifentanyl) that suppresses AV or SA node may abolish intrinsic heart rate and render the patient PPM dependent. Anxiety and surgical stress may affect pacing threshold and increase myocardial oxygen demands. Thus, consideration should be made to increase pacing rate to meet the metabolic demand prior to induction. In our cases, the pacing rate was adjusted from 80 to 100 bpm then reduced back to 80 bpm after the surgery. Intraoperatively, monopolar electrocautery is the commonest exogenous source of electromagnetic interference (EMI) hazard. The EMI may trigger abnormal sensing causing pulse generator inhibition and malfunction. Ultrasonic scalpel and bipolar cautery are recommended against monopolar to minimise EMI. Monopolar is to be used at lowest feasible energy with only 1s short burst and 10s interval pause. In summary, it is crucial to understand effects from anaesthesia and EMI from surgery to formulate perioperative plans and prevent device-related interactions. In modern PPM, magnet and mode reprogramming rarely necessary but the pacing rate should be tailored to anaesthesia technique and agents use.

	CASE 1	CASE 2
DEMOGRAPHIC	3 year old 23.9kg ASA III	3 year old 13kg ASA III
RELEVANT HISTORY	<p>1. Atrioventricular septal defect (AVSD) in failure on oral frusemide and spironolactone; status post</p> <ul style="list-style-type: none"> • pulmonary artery banding at 2 month old. • pulmonary artery de-banding and augmentation, atrioventricular canal & valves repair, and posterior annuloplasty at 17 month old • complicated with complete heart block, PPM inserted on POD 14. • anti-failures discontinued 3 months after surgery 	<p>1. Ventricular septal defect (VSD) with pulmonary stenosis and small right ventricle in failure on oral frusemide, spironolactone and captopril; status post</p> <ul style="list-style-type: none"> • VSD and right ventricular outflow tract resection at 3 month old. • complicated with complete heart block and low cardiac output syndrome with multi organ failure, PPM inserted on POD 7. • required prolong ventilatory support, discharged 3 months later • anti-failures discontinued 6 months after surgery
PACEMAKER DETAILS	<p>Evity 8 DR-T, BIOTRONIK</p> <ul style="list-style-type: none"> • Dual chamber - Epicardial • Bipolar system • DDDR mode • Pacing rate of 80 bpm <p>Patient is pacemaker dependent</p>	<p>Epyra 6 DR-T, BIOTRONIK</p> <ul style="list-style-type: none"> • Dual chamber - Epicardial • Bipolar system • VVI mode • Pacing rate of 80 bpm <p>Patient is NOT pacemaker dependent. Heart rate 90 – 100bpm</p>
SURGICAL DIAGNOSIS & OPERATION	<p>Left Undescended testis</p> <ul style="list-style-type: none"> • Left orchidopexy • Generator to surgical site distance 12cm 	<p>Bilateral profound sensorineural hearing loss</p> <ul style="list-style-type: none"> • Right cochlear implant surgery • Generator to surgical site distance 26cm
ANAESTHESIA & ANALGESIA	<ul style="list-style-type: none"> • GA spontaneous <ul style="list-style-type: none"> • Sevoflurane maintenance • Lt ilioinguinal block + scrotal infiltration • IV Fentanyl 1mcg/kg • IV Ketamine 0.1mg/kg • IV Dexamethasone 0.2mg/kg 	<ul style="list-style-type: none"> • GA IPPV <ul style="list-style-type: none"> • TCI Propofol • TIVA Remifentanyl • Field-block by surgeon • IV Ketamine 0.1mg/kg • IV Paracetamol 15mg/kg • IV Dexamethasone 0.2mg/kg • IV Morphine 0.05mg/kg (end)
PACEMAKER CONCERNS & MANAGEMENT	<p>1. Pacemaker dependent</p> <ul style="list-style-type: none"> • Increase pacing rate to 100 bpm prior to induction • reprogrammed to 80 bpm prior to extubation 	<p>1. TIVA abolish intrinsic heart rate</p> <ul style="list-style-type: none"> • Increase pacing rate to 100 bpm prior to induction • reprogrammed to 80 bpm in PACU after extubation

Table 1. Summary of the cases.

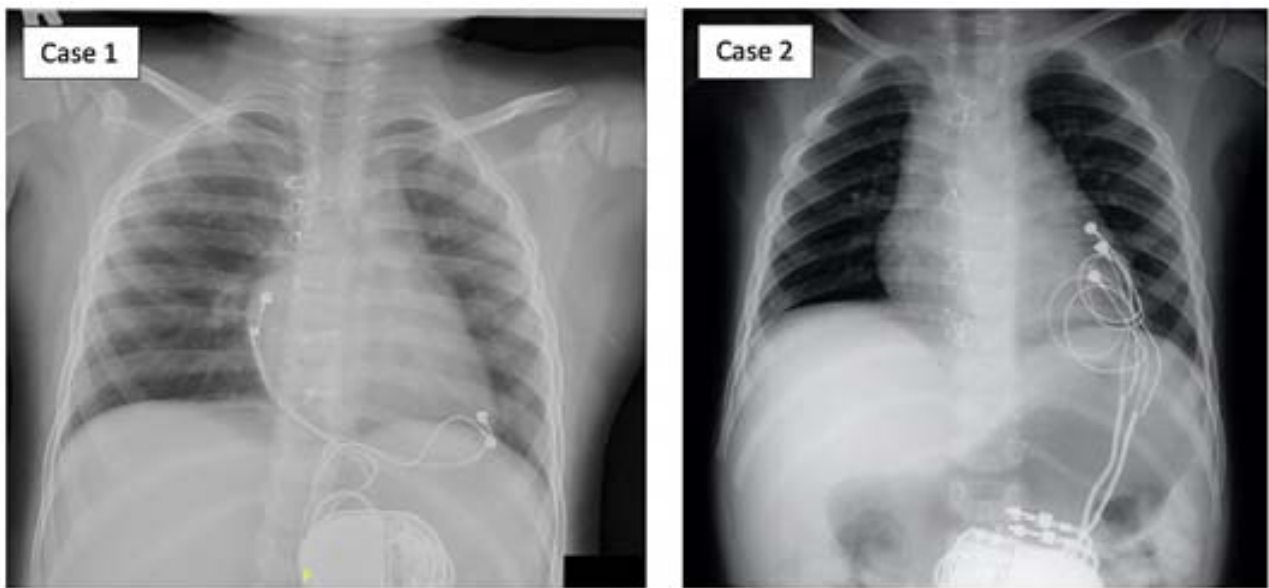


Figure 1: CXR of case 1 and case 2, showing PPM with bipolar pacing wire system (two wires implanted at epicardium of designated chamber). Generator was embedded at epigastrium in case 1 and umbilical quadrant in case 2.

V2-8

Spinal Anaesthesia: The Choice in Preterm Neonates with Chronic Lung Disease

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C N Radhakrishnan³, Karthik Nagesh N⁴

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Introduction: Chronic lung disease (CLD) is an important cause of morbidity and mortality in preterm infants. General anesthesia adds insult to the injury by increasing the risk of apneic spells and incidence of post operative mechanical ventilation in these infants. We present a case series of twenty preterm neonates with chronic lung disease who were given spinal anesthesia for inguinal hernia repair.

Case Description: Preterm babies with CLD are given spinal anesthesia for inguinal hernia repair in our institute. Routine preoperative evaluation including cardiac and neurological assessment, complete blood count and coagulation profile is done. Intravenous access is secured in the NICU. One hour prior to the procedure EMLA patch is placed on the lower back at the proposed site of lumbar puncture. In the operating room, care is taken to keep the babies warm, ASA standard monitors are connected, and dextrose-soaked pacifier is used to keep the infant quiet. Maintenance rate of appropriate IV fluid is given. If the baby is on oxygen or nasal CPAP, the same is continued intraoperatively. Sub arachnoid block is performed in the lateral position. EMLA patch is removed, and the area prepped with warm betadine solution. 26G hypodermic needle is used to give the block and 0.2mL/kg of 0.5% heavy bupivacaine is injected intrathecally using an insulin syringe. No sedatives are given and post-operatively they are shifted back to the NICU. The average gestational age of our group at surgery was 41.25 ± 10.7 SD and the weight of the babies was 2.7 ± 1.9 SD. The block was effective in all cases and there were no cardiorespiratory events in the period during and following the procedure.

Conclusion: Anesthetic management of preterm infants with chronic respiratory sequelae of prematurity is very challenging. Subarachnoid block is a safe and effective alternative to general anesthesia in these babies.

	Gestational age at surgery	Weight at surgery	at	Gestational age at birth	Weight at birth
Mean	41.25	2709.5		31.7	1625.25
SD	5.3496	951.76		3.09	656.68
2 SD	10.699	1903.52		6.19	1313.36





Day 3_Room C

Abstract Presentation 5 (In-person)

Chair(s): Hyo-Jin Byon (Korea)
Hye Mi Lee (Korea)

AP5-1

**Predictors of Sedation Failure with Initial Dose of
Intranasal Dexmedetomidine and Oral Midazolam for
Pediatric Procedural Sedation**

Withdrawn

AP5-2

Retrospective Study on an Inhalational Sevoflurane Technique for Ex-preterm Infants Undergoing Elective Inguinal Hernia Surgery

Esha Nilekani, R Jayanthi, S. Ramesh

Department of Paediatric Anaesthesia, Kanchi Kamakoti CHILDS Trust Hospital, Chennai, Tamil Nadu, India

Background: Awake regional anesthesia in high-risk infants can be challenging and sedation is associated with apnea. However, sevoflurane for procedural sedation with minimal airway intervention may have a lesser frequency of complications.

Methodology: Over a year, retrospectively data on ex-preterm infants who underwent routine hernia surgery were included in this study. All infants were optimized preoperatively with blood transfusion for anemia (<10 g/dL) and caffeine. They were sedated with inhalational sevoflurane, and then given regional anesthesia (caudal alone for unilateral repair & combined spinal/caudal anesthesia for bilateral repair), and the airway maintained with mask/LMA via spontaneous ventilation. In the event the child moved on incision, failed block was considered and intubation with paralysis was done. The efficacy of the technique was assessed via the number of attempts of regional anesthesia, incidence of bloody tap, failed block and the type of airway intervention (mask/LMA/ ET). Post operatively the infant was monitored specifically for apnea, bradycardia and hypotension. Data analysis was performed with counts/percentage for parametric data and ANOVA multivariate analysis for the continuous variables.

Results: In a sample size of forty infants, most infants were between 40-52 weeks post conceptual age (PCA). 18 infants were anemic and transfused packed cells a day prior to surgery. The airways were maintained via pro-seal LMA in 26, mask in 14 infants, and no failed blocks were noted. 16 infants received caudal anesthesia in 1st attempt with no bloody tap (100% success), and in the combined regional of 24, a second attempt (88% success with 1st attempt) was needed in 3 out of 24, incidence of 4% of bloody tap. Two infants developed apnea [incidence 5%] both <45 weeks PCA with anemia and weight <2kgs not needing further intervention.

Discussion: Sevoflurane has been used in preterm infants as the sole sedation technique for injections retinopathy of pre-maturity as it preserves spontaneous ventilation. Combining sevoflurane with a regional anesthetic in these high-risk ex-preterm infants allows minimal airway intervention and a better success rate of regional administration with no failed blocks. Apnea of pre-maturity is seen up to 60 weeks PCA with added risk in previous apnea, anemia, neurological disease, sepsis, metabolic derangement and anesthetic drugs. Optimizing the preoperative anemia and caffeine alongside close monitoring gave a lower incidence of apnea comparable to previous studies.

The Use of Dexmedetomidine for Pediatric Patients with Conjoined Twins undergoing Computed Tomography Thoracoabdominal

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Introduction: Conjoined twins are a very rare developmental accident of uncertain etiology. Prevalence has been previously estimated to be 1 in 50,000 to 1 in 100,000 births.

Objective: To investigate a case report using Dexmedetomidine for sedation management in conjoined twins patients.

Case Study: A - 4 months old baby girl referred to Saiful Anwar Hospital, Malang to be scheduled for a separation surgery. Before the separation surgery, pediatric surgeon need a radiology imaging to know the fusion between the two babies. The Pediatric - surgeon need an imaging from CT thoraco-abdominal with contrast. We do the pre-operative visit to the patient, we decide to do the sedation with Dexmedetomidine as the regiment of choice for the patient. The challenging part in anesthesia for this patient is the CT scan room is not prepared for two individuals being anesthetized in one time. So that, we prepared the CT scan room with double set equipment, labeled the infants and put color code for each infant 1 day before the procedure. We also gathered a special team and do the simulation one day before the procedure. We monitored the patient with ASA standard monitoring for pediatric. Before the induction, we inject the first baby with atropine 0,01 mg/kg (IV), to observe if there is a raising heart rate to the second infant, and turn out there is no increasing heart rate to the second infant. As the induction regiment, dexmedetomidine loading dose 2 mg/ kg over 10 minutes for each baby. After the loading dose, we start the maintenance dose with Dexmedetomidine 0,4 mcg/kg/h.

Conclusion: Ambulatory for conjoined twins is challenging. We prepared two anesthesia machines, doubled every drug and labeled each equipment with color code. We use blue and red sticker for every drug and other equipment so that if the patient fell in an emergency situation, each baby had their own drugs, equipment and anesthesia machine. Dexmedetomidine could be drug of choice for TIVA in ambulatory for conjoined twin patient. Atropine injection with dose 0,01 mg/kg before the induction could be useful to predict the fusion between the babies. There is no respiratory depression for the patient.

AP5-4

Stirp Sugar Midazolam! New Formulation of Midazolam (Midazolam Loaded Oral Film Via Electrospinning)(Preliminary Study)

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Background: It is possible with effective premedication make comfortable for both the children and their family and doctors in the elimination of pre-operative anxiety and the opening of vascular access in children who will undergo surgery. In this context, it is aimed to develop the most suitable pharmaceutical form that can be used orally, high stability, taste tolerable, and non-cytotoxic, which can be easily accepted by the child, for routinely used drugs to calm children before surgery.

Methods: Water-soluble poly(vinyl alcohol) (PVA, MW: 30,000-70,000) was used as the polymer for green electrospinning (1). The film-forming property of PVA was evaluation by studying two different polymer concentrations. Briefly, PVA was dissolved in water at 90°C under magnetic stirring, and the solution was cooled to room temperature. Plasticizer, sweetener, color agent or aromatizer, saliva simulator, preservative and ethanol as an active pharmaceutical ingredient (API) solvent were added into the solution. Table was shown the formulation contents. Flow rate, voltage and the distance of the nozzle tip to the collector were changed as device parameters, and the optimum values were determined as 4 mL/h, 24 kV and 150mm, respectively.

Results: According to our results (Table), it was determined that PVA did not form fibers at low concentrations. Although the polymer concentration used varies with the molecular weight of the polymer, 15% w/v polymer concentration was sufficient to form fiber according to the PVA type used (2).

Discussion: As a result of the studies, it was seen that the best oral film was obtained with ODF3. In the ongoing studies, using the F3 formulation parameters, midazolam-loaded multilayer oral films which have in the middle layer containing the API will be prepared and their characterization will be made.

Funding: This work was supported by the Karadeniz Technical University Scientific Research Projects Coordination Unit (TAY-2021-9763 and TSA-2022-10503).

Refs: 1. Zhong T. et al., Carbohydr Polym, 2021; 2. Celebioglu A. et al., Carbohydr Polym, 2014

Sedation in a Child with Difficult Airway for Magnetic Resonance Imaging (MRI)

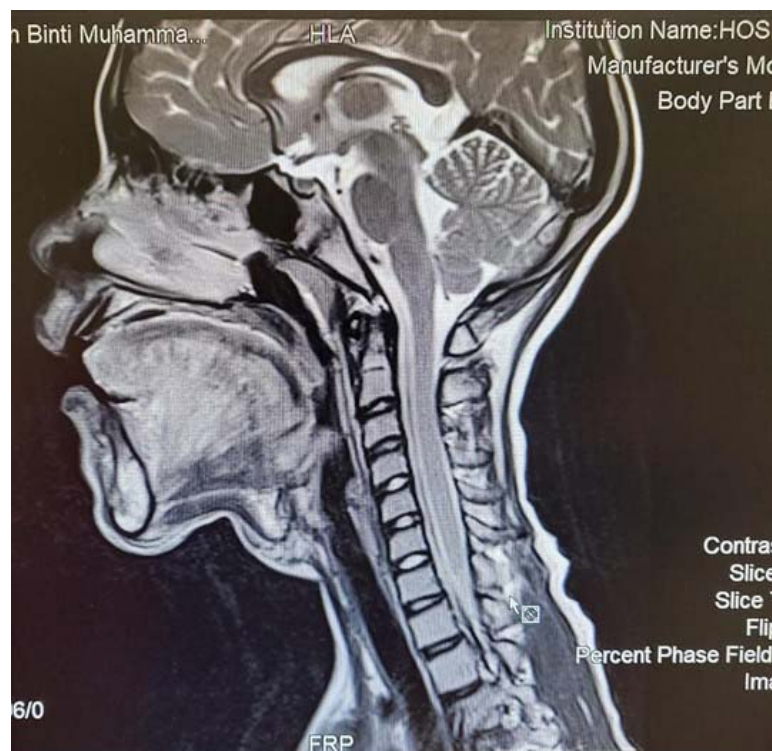
Nirawanti Mohamad Said, Ye Yun Phang

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Background: Magnetic resonance imaging (MRI) scans in children can be challenging to anaesthesiologists especially for patients with difficult airways. Current trend of procedural sedation using combination of dexmedetomidine and propofol shows promising results as they are associated with fewer respiratory events.

Case Description: A 9-year-old-girl, weighing 20kg with delayed developmental milestones and venolymphatic malformation of the neck, was scheduled for an MRI scan of the neck. She had 3 sclerotherapy injection for the neck mass and defaulted follow up for 4 years ago. The neck swelling has been increasing in size over the past 2 years. A nasoendoscopy showed crowded oropharynx with cystic lesion around epiglottis region. An attempt to sedate the child using chloral hydrate was unsuccessful thus she was posted for MRI under general anaesthesia. Pre-anaesthetic evaluation showed limited mouth opening with huge and diffuse neck swelling. Due to the anticipation of a difficult airway and possibility of 'cannot intubate, cannot ventilate' (CICV), the child was planned under sedation using a combination of dexmedetomidine and propofol with fiberoptic intubation (FOI) as backup. Once intravenous cannula secured, a loading dose of 1mcg/kg dexmedetomidine was administered over 10 minutes followed by an infusion of 1mcg/kg/h. Subsequently, propofol infusion was administered as an adjunct sedation at the rate of 2mg/kg/h, aiming to achieve Ramsay sedation scale (RSS) of 5. Simultaneously, continuous vital sign monitoring, pulse oximetry and end-tidal CO₂ were attached. After being transferred to the MRI room, the child received oxygen supplementation of 5 L/min through a facemask. During contrast administration, the child's airway became obstructed with the presence of stridor and oral secretions. Suctioning was done and airway patency was maintained with nasopharyngeal airway. Dexmedetomidine infusion was titrated up to 1.5mcg/kg/h to maintain RSS above 4. There were no episodes of desaturation and haemodynamic were stable. MRI was successfully done after 50 minutes to confirm the extent of swelling and airway narrowing. The child was monitored in recovery room until fully awake.

Discussion: The use of dexmedetomidine and propofol has helped to overcome these difficulties as the risk of airway obstruction is minimised, the induction and recovery was smoothened. This technique can be an option in managing difficult airway patients in remote setting.



AP5-6

A Balancing Act of Survival: A Case Report on the Anesthetic Management of an Ex Utero Intrapartum Procedure

Virtual

AP5-7

Effect of High-flow Nasal and Buccal Oxygenation on Safe Apnea Time in Children with Open Mouth

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Introduction: High-flow nasal oxygenation (HFNO) is being applied for various purposes, and its utility as method of oxygenation during preoxygenation and apnea for intubation has been studied. HFNO is reported to prolong duration of apnea while maintaining adequate oxygen saturation with the mouth closed. We aimed to examine whether the same effect can be expected when patients' mouth are open and planned a prospective study.

Methods: We compared the effectiveness of HFNO and buccal oxygenation (BO) in children with their mouth open, simulating airway management conditions. Thirty-eight patients, aged 0-10 yr were randomly allocated to either the HFNO group (n=17) or the BO group (n=21). After induction of anesthesia including neuromuscular blockade, manual ventilation was initiated until the expiratory oxygen concentration reached 90%. Subsequently, ventilation was paused, and the patient's head was tilted and mouth was opened. During apnea, the HFNO group received oxygenation at a flow rate of 2 L/min/kg while the BO group received oxygen to the buccal space via an oral Ring-Adair-Elwyn tube at a flow rate of 0.5 L/min/kg. Ventilation was resumed when pulse oximetry decreased to 92% or the apnea time exceeded twice the apnea time without any oxygenation previously reported, which was defined as 'success' in prolongation of safe apnea time.

Results: The success rate of safe apnea time prolongation was 100% in the HFNO group compared to 76.2% in the BO group ($p = 0.041$). In 5 patients who were unable to prolong safe apnea time, the average duration of apnea was 1.17 times longer than the apnea time without any oxygenation previously reported. Oxygen reserve index, end-tidal or transcutaneous carbon dioxide partial pressure, and pulse oximetry did not differ between groups during or after the apnea period.

Discussion: Although both of them prolonged apnea time, HFNO was superior to BO. The difference can be explained by flow rate and mechanism of oxygenation. As there was no difference in carbon dioxide level, we should be aware of hypercapnia during apneic oxygenation. In conclusion, we can consider HFNO as means of apneic oxygenation when attempting airway management in children. BO may also be useful for lengthening safe apnea time when HFNO is not available.

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Table 1. Oxygenation and ventilatory parameters of patients received high-flow nasal oxygenation or buccal oxygenation. Values are mean \pm SD or median (IQR [range]).

	HFNO group (n = 17)	BO group (n = 21)	p-value
ORi TM after apnoea	0.2 (0.05 – 0.3 [0 – 0.8])	0.17 (0.08 – 0.25 [0 – 0.88])	0.337
Lowest ORi TM	0.18 (0 – 0.3 [0 – 0.75])	0.12 (0.06 – 0.22 [0 – 0.45])	0.908
Lowest S _p O ₂ (%)	100 (100 – 100 [97 – 100])	100 (100 – 100 [79 – 100])	0.622
Highest E _t CO ₂ (mmHg)	53.7 \pm 6.3	51.0 \pm 7.6	0.250
T _c CO ₂ after apnoea (mmHg)	56.7 \pm 19.6	57.6 \pm 9.0	0.870

Statistical comparisons were done Student t-test for normally distributed data and Mann-Whitney U test for nonparametric analysis.

HFNO group; High-flow nasal oxygenation at a rate of 2 L.min⁻¹.kg⁻¹ during apnoea, BO group; Buccal oxygenation at a rate of 0.5 L.min⁻¹.kg⁻¹ during apnoea, ORiTM; Oxygen reserve index, E_tO₂; End-tidal oxygen concentration, E_tCO₂; End-tidal carbon dioxide partial pressure, T_cCO₂; Transcutaneous carbon dioxide partial pressure

AP5-8

Near-infrared Spectroscopy Monitoring Failure in a Patient with Chronic Hypoxemia Undergoing Total Correction of Tetralogy of Fallot

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Background: Near-infrared spectroscopy is a reliable and non-invasive technique for monitoring regional blood flow and measuring regional oxygen saturation (rSO_2). While previous studies have shown that secondary erythrocytosis does not affect cerebral rSO_2 , profound polycythemia, in this case, appeared to impede the measurement of cerebral oxygenation by near-infrared spectroscopy.

Case Description: A 12-year-old boy from Cambodia was admitted with dyspnea, cyanosis, and activity limitations for total correction of tetralogy of Fallot. Four years earlier, the patient had undergone a right Blalock-Taussig shunt operation but had not received appropriate postoperative care and could not take antiplatelet medication due to financial constraints. Despite receiving 6 L/min of nasal prong oxygenation, the patient had severe hypoxia with pulse oximetry (SpO_2) of 72%. The preoperative blood test revealed secondary erythrocytosis, with a hematocrit of 71.3%. The patient underwent general anesthesia for open heart surgery according to the institution's protocol, and standard monitoring, including O3[®] pediatric regional oximetry (Masimo, Irvine, CA, USA), was applied. Regional oximetry was measured at four sites: the left and right forehead (S1 and S2), splanchnic (S3), and renal (S4) (Fig. 1). After the induction of anesthesia, the patient showed SpO_2 of 61-74% and partial pressure of oxygen (PaO_2) of 49 mmHg despite mechanical ventilation with a fraction of inspired oxygen (FiO_2) of 0.8. However, cerebral rSO_2 values (S1 and S2) were unobtainable until the initiation of cardiopulmonary bypass (CPB) (Fig. 2). While the initial intraoperative hematocrit was unmeasurable (>65%), after the initiation of CPB, hemodilution was achieved, resulting in hematocrit of 49%. The operation went smoothly, and the patient was successfully weaned from the cardiopulmonary bypass with the aid of inhaled nitric oxide. Post-CPB SpO_2 , PaO_2 , and hematocrit were relatively 100%, 104 mmHg, and 44% with a FiO_2 of 0.6.

Discussion: In this case, polycythemia may have contributed to the failure to monitor cerebral rSO_2 . This hypothesis is supported by the fact that cerebral rSO_2 monitoring became feasible after acute hemodilution. Medical professionals managing chronically hypoxemic children with significant secondary erythrocytosis should recognize the risk of cerebral rSO_2 monitoring malfunction.

Figure 1. Regional oxygen saturation monitoring sites. S1, left forehead; S2, right forehead; S3, splanchnic; S4, right renal.

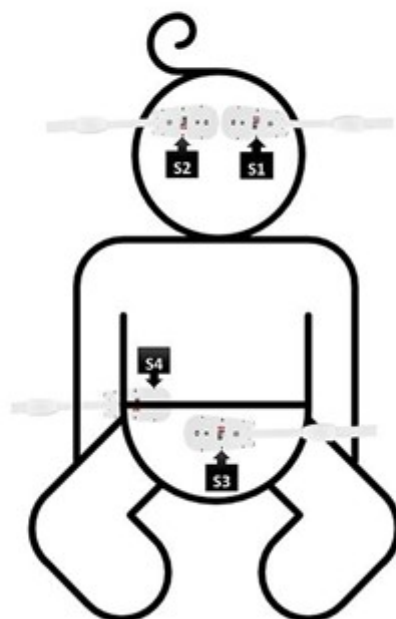
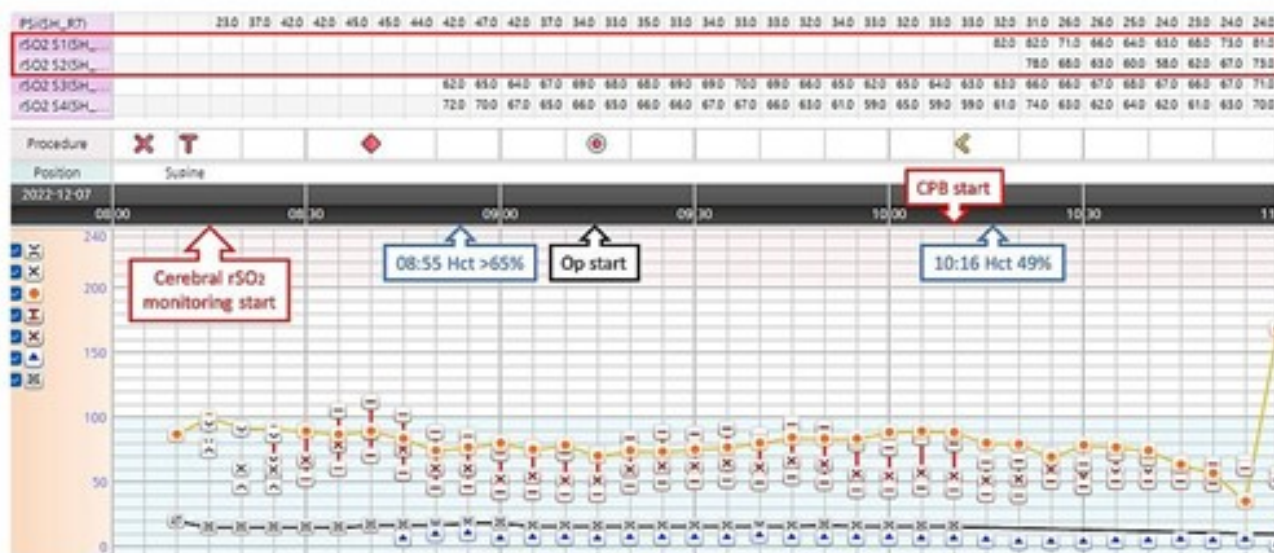


Figure 2. Anesthesia records of the patient from the induction of general anesthesia to the initiation of cardiopulmonary bypass. rSO₂, regional oxygen saturation; Hct, hematocrit; Op, operation; CPB, cardiopulmonary bypass.





Day 3_Room C

Abstract Presentation 6 (In-person)

Chair(s): Eun-Hee Kim (Korea)
Yong-Hee Park (Korea)

AP6-1

Implementation of “Goal Directed Bleeding Management” at Shahid Gangalal National Heart Center

Virtual

AP6-2

The Outcomes of PICC Insertion in Pediatric Patient at Siriraj Hospital

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Background: Peripherally-inserted central catheter (PICC) is widely used for intermediate- and long-term venous access. Venipuncture and catheterization in pediatric patients were challenging. Children's vein may become damaged by frequent and painful needle insertions. In Thailand, PICC was not yet prevailing even in adult patients and limited of the published works in pediatric patients. This study aims to demonstrate the outcome of PICC insertion in pediatric patients by the Anesthesia Line Service Team (ALiST) of a tertiary-care, university hospital in Thailand.

Methods: This is a retrospective, descriptive study which enrolled patients from January 2018 to December 2021. The inclusion criteria were pediatric patients (age < 15 years), body weight more than 5 kg with no history of previous complicated central venous accesses. The primary outcome is the success rate of insertion. The characteristic of patients, catheter, reason of removal and complications were also reported.

Results: A total of 1,850 PICCs were inserted during the study period in which 149 PICCs were inserted in pediatric patients. There were 63 boys and girls evenly. The median age of patients was 5.47 years (ranging from 3 months to 15 years). The median height was 106.06 cm (42-170 cm), while median weight was 20.10 (2.97-73.73 kg). The successful insertion rate was 99.21%. All of them were inserted by using ultrasound-guided technique, with or without fluoroscopy. No complications during insertion were noted. The mean indwelled catheter days were 66.48 days (4-402). A 4 French single lumen catheter was the most common PICC used (38.1%), followed by 3 French, single lumen (32.5%) and 5 French, double lumen (29.4%). Reason for removal of PICC lines were completion of therapy (50.86%), catheter malfunction (25.86%), infection (6.9%), and accidental removal (2.59%).

Conclusion: This is the first report for PICC lines insertion in pediatric patient in university hospital of Thailand. Our study showed the success rate of 99.41%. PICC in pediatric patients are safe and low complications.

Routine to Risk-Based: A Pediatric Hemophilia B Case Report and the Adoption of Targeted Preoperative Blood Testing Practices with Questionnaires

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Background: In line with the principles of the Choosing Wisely campaign, which aims to reduce unnecessary medical tests and procedures, there has been an increasing emphasis on adopting risk-based preoperative blood testing practices in pediatric surgeries. Identifying patients with potential bleeding risks is crucial. This case presentation discusses a pediatric patient with hemophilia B who experienced postoperative complications, prompting our institution to shift from routine preoperative blood tests to a targeted approach using questionnaires.

Case Presentation: A 5-month-old male infant with small patent ductus arteriosus underwent inguinal hernia repair surgery. Preoperative blood tests were normal, and coagulation tests were not performed. Surgery was performed under general anesthesia with caudal epidural anesthesia. Postoperatively, a hematoma developed, and the patient was diagnosed with moderate hemophilia B. Further testing revealed a family history of the condition. This case highlights the importance of targeted preoperative assessments and a thorough family history review.

Discussion: Hemophilia B is a rare inherited bleeding disorder. Despite the consensus that routine preoperative blood tests for pediatric patients undergoing minor surgeries are neither cost-effective nor necessary, this practice remains prevalent in Japan. Implementing targeted questionnaires to assess patients' personal and family history of bleeding disorders can help identify those at higher risk and guide appropriate preoperative testing and management. Our experience has prompted a shift away from routine preoperative blood tests to a more targeted approach using questionnaires, focusing on individual patient risk factors.

Conclusion: The pediatric hemophilia B case report emphasizes the importance of adopting a risk-based approach to preoperative blood testing using targeted questionnaires to optimize patient assessment and ensure patient safety.

AP6-4

Use of Continuous Positive Airway Pressure during Sevoflurane Inhalational Induction Does Not Result in Faster Induction but Increases Sevoflurane Consumption

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Introduction: Inhalational induction of anaesthesia is more acceptable to children. Sevoflurane is inhalation anaesthetic agent of choice because of low pungency, a non-irritant odour, and a low blood: gas partition coefficient. Continuous positive airway pressure (CPAP) refers to the delivery of a continuous level of positive airway pressure. It is functionally similar to PEEP (positive end expiratory pressure) and is most commonly used in the management of sleep-related breathing disorders, cardiogenic pulmonary oedema and obesity hypoventilation syndrome.

Methods: A prospective, randomized controlled trial conducted at a single centre in New Delhi, India. Children aged 1-5 years, ASA physical status classification I-II, posted for ophthalmic examination under general anaesthesia. 129 subjects were included and randomized into three groups; group Z (Zero CPAP), group A (5 cm H₂O) and group B (10 cm H₂O) using a computer-generated random number table. Subjects were anaesthetized according to a predecided protocol. Important time points: Starting time (T₀), loss of eyelash reflex (T₁), first prick to IV access (T₂), placement of SGD (T₃), 15 seconds after SGD placement (T₄). 80 (62%) out of 129 patients recruited were males.

Results: No significant differences were observed in the anthropometric variables. No significant difference was observed in the time to induction and time to supraglottic device insertion between the study groups was noted. There was a significant difference in sevoflurane consumption between the study groups ($p < 0.05$). No difference in number of IV attempts, propofol requirement was observed in the two groups.

Conclusion: Use of CPAP during sevoflurane induction does not lead to faster induction but increases agent consumption.

Effect of Single-dose Intravenous Lignocaine versus Fentanyl on Neuromuscular Recovery Time after General Anesthesia in Elective Pediatric Surgery: A Randomized Controlled Pilot Study

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Background: Intra-venous (IV) lignocaine is often used to prevent the airway response to extubation, but may prolong the duration of action of neuromuscular blocking drugs (1). The primary objective of this study was to compare neuromuscular recovery time with IV lignocaine versus fentanyl, in pediatric patients undergoing elective surgery under general anesthesia (GA). Secondary objectives included comparison of clinical parameters and respiratory events.

Methods: A randomised double blinded pilot study was conducted in children aged 2-8 years undergoing GA with neuromuscular blockade, who received either 1.5mg/kg of lignocaine (LG) or 0.5 mcg/kg of fentanyl (FG) IV, just prior to giving reversal at a train of four (TOF) count of 2-3. Time to achieve TOF ratio of 0.9 and extubation was noted as well as hemodynamic and respiratory parameters. Incidence of coughing, bucking, laryngospasm etc. were also noted. Post hoc power analysis was done with a sample size of 21 in each group. P value <0.05 was considered significant.

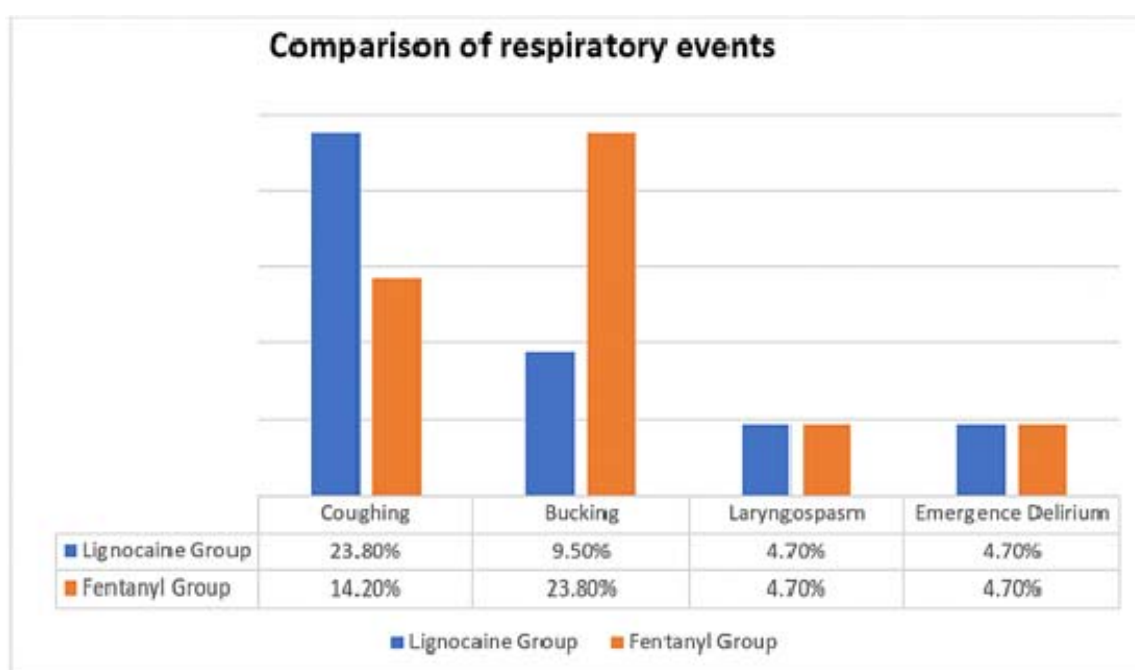
Results: Demographic, operative data and clinical parameters were similar in both groups (Figure 1). Time from reversal to TOF ratio of 0.9 was similar in both LG (6.79 ± 3.03 mins) and FG (6.79 ± 3.31 mins), $p=0.99$. Time to extubation was also similar in both groups (8.14 ± 3.31 vs 9.19 ± 2.89 mins). The incidence of bucking was more in FG (23.8%) vs LG (9.5%), $p=0.41$ (Figure 2).

Discussion: Klucka et al found the incidence of residual blockade neuromuscular blockade in pediatric population to be 48.2% in the operation room and 26.9% in post anesthesia care unit (2). Studies on lignocaine and neuromuscular recovery is lacking in pediatric surgeries. Single-dose IV lignocaine administered before reversal did not prolong neuromuscular recovery time compared to fentanyl, with a similar (low) incidence of respiratory events in pediatric patients. Thus, both fentanyl and lignocaine can be safely used in pediatric patients to prevent perioperative adverse respiratory events, guided by intra-operative neuromuscular monitoring.

References: 1. Bryssine B, Maurin C, Soubiroud JL, Ksarellof M, Roche O. Abstract PR425: Interaction of Intravenous Lidocaine with Neuromuscular Blocking. *Anesthesia & Analgesia*. 2016 Sep 1;123(3S):538; 2. Klucka J, Kosinova M, Krikava I, Stoudek R, Toukalkova M, Stourac P. Residual neuromuscular block in pediatric anaesthesia. *Br J Anesth*. 2019 Jan;122(1):e1-e2

Table 1: Comparison of haemodynamic and respiratory parameters

S.no.	Characteristics		LG (n= 21)	FG (n= 21)	P Value
1	Heart Rate	Baseline	106 ± 21.02	102.05 ± 19.41	0.530
2		At reversal	108.85 ± 20.54	117.28 ± 20.48	0.191
3		At extubation	119.57 ± 20.73	126.71 ± 28.49	0.359
4		5 mins post extubation	108.80 ± 23.03	119.33 ± 26.17	0.174
5	SBP (mm Hg)	Baseline	94.52 ± 12.84	98.81 ± 15.56	0.338
6		At reversal	99.85 ± 10.05	105.71 ± 14.06	0.129
7		At extubation	107.24 ± 10.52	112.71 ± 13.72	0.155
8		5 mins post extubation	101.43 ± 14.72	104.76 ± 12.79	0.438
9	DBP (mmHg)	Baseline	56.19 ± 11.10	55.95 ± 13.49	0.951
10		At reversal	50.09 ± 9.52	62.42 ± 11.11	0.303
11		At extubation	67.47 ± 11.90	67.19 ± 12.33	0.9395
12		5 mins post extubation	60.76 ± 12.39	63.05 ± 10.45	0.522
13	Respiratory Rate	Baseline	20.71 ± 3.29	19.67 ± 4.69	0.408
14		At extubation	28.71 ± 7.19	26.76 ± 6.95	0.377
15		5 mins post extubation	23.24 ± 7.61	24 ± 6.01	0.721
16	SPO ₂	Baseline	99.28 ± 0.46	99.52 ± 0.51	0.183
17		At reversal	99.23 ± 0.62	99.23 ± 0.62	0.989
18		At extubation	99.52 ± 0.51	99.47 ± 0.60	0.908
19		5 mins post extubation	99.42 ± 0.51	99.57 ± 0.59	0.364



The Perioperative Coagulation Profile in Pediatric Patients Undergoing Liver Transplant Surgery

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Background: Bleeding and coagulopathy remain challenging in pediatric liver transplant perioperative management. Thromboelastography (TEG) is a point-of-care test that may be utilized to guide therapy. However, the benchmark intra- and postoperative data, especially regarding coagulation complications in pediatric liver transplant patients, still need to be made available.

Aim: To summarize the perioperative trend of coagulation profile in children undergoing liver transplant surgery.

Methods: We conducted a descriptive study based on medical records, including all pediatric patients who received liver transplants from October-April 2023 in Cipto Mangunkusumo Hospital, Indonesia. We collected conventional coagulation profile data (platelet count, prothrombin time (PT), and activated partial thromboplastin time (APTT)) before and after the transplant. TEG profiles were collected before induction of anesthesia, at the anhepatic, and reperfusion phases. We calculated the difference in values by using SPSS ver. 28.

Results: The analysis included ten patients [1.82 (0.90) years, 10.21 (1.41) kgs] with cirrhosis due to progressive familial intrahepatic cholestasis (n=1) and biliary atresia (n=9). During the postoperative period, all patients had lower platelet count ($p=.002$), longer PT ($p=.002$), and longer APTT ($p=.034$) compared to preoperative values. Compared to pre-induction, the children had longer clot formation time (K) ($p=.012$), smaller α angle ($p=.020$), lower maximum amplitude (MA) ($p=.023$), lower generated value (G) ($p=.035$), and lower estimated percent lysis (EPL) ($p=.048$) at anhepatic phase. In contrast, they had longer K ($p=.032$), smaller α angle ($p=.047$), lower MA ($p=.031$), and lower G ($p=.022$) in the reperfusion phase. All TEG parameters between the anhepatic and reperfusion phases were similar.

Discussion: The lower platelet, longer INR, and longer APTT ratio trend showed impaired hemostasis ability during the postoperative period. Furthermore, the TEG trend suggested that the impairment had started at the anhepatic phase of liver transplant surgery and persisted to the reperfusion phase. Periodic TEG monitoring during the anhepatic and reperfusion phase may be beneficial to anticipate and immediately correct coagulation problems, especially in patients with prolonged anhepatic phases. Future studies may explore further use of periodic TEG and its effect on intra- and postoperative coagulation-related complication rates and other clinical outcomes.

Table 1. Perioperative conventional coagulation profile in children undergoing liver transplant

Coagulation profile	Pre-operative	Post-operative
Platelet count (/ul)	161,625 (97,228.65)	51,375 (36,947.60)
INR (PT ratio)	1.07 (0.14)	1.81 (0.43)
APTT ratio (patient: control)	1.25 (0.21)	2.27 (1.18)

Values expressed as mean (standard deviation, SD). APTT=activated partial thromboplastin time; INR=international normalized ratio; PT=prothrombin time.

Table 2. Perioperative coagulation profile based on TEG in children undergoing liver transplant

TEG profile	Pre-induction	Anhepatic	Reperfusion
R time (min)	6.82 (1.65)	9.82 (5.37)	9.15 (5.14)
K time (min)	1.98 (0.88)	3.08 (1.22)	4.45 (3.33)*
α angle (°)	62.28 (12.77)	53.51 (10.27)	43.96 (21.63)
MA (mm)	63.06 (12.29)	54.44 (5.91)	46.11 (14.41)
G (dynes/cm ²)	9.86 (5.35)	6.41 (1.98)	3.95 (2.22)*
EPL	0.1 (1.64)*	0.00 (0.13)*	0.00 (0.20)*
A (mm)	62.80 (18.15)*	53.59 (9.29)	44.35 (12.07)*
CI	-1.64 (4.74)	-4.37 (4.96)	-5.71 (5.79)
LY30	0.1 (0.33)*	0.0 (0.30)*	0.0 (0.20)*

Values expressed as mean (standard deviation, SD). *Values expressed as median (interquartile range, IQR). EPL=estimated percent lysis; G=generated value; K time=clot formation time; LY30=clot lysis at 30 min; MA=maximum amplitude; SD=standard deviation; TEG=thromboelastography; R time=reaction time.

Experiences of Our Pediatric Anesthesia after Devastating Earthquakes in Turkey

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Background: 7.8 and 7.5-magnitude earthquakes, caused over 50,000 deaths and more than 122,000 wounded people, occurred in Kahramanmaraş on February 6, 2023. The healthcare system was affected by these earthquakes. Victims were transported to tertiary care hospitals. In this study, we aim to documents anesthetic management of children victims who needed urgent surgical care.

Methods: 41 under 18 years old pediatric patients were admitted via air ambulance to undergo surgical operations after the first intervention in where earthquake-affected area. In this study, these patients' medical records were analyzed retrospectively. Demographic data, surgical procedures, anesthesia methods, intensive care needs, hours under ruins, complications, mortality, and morbidity of pediatric patients were reviewed. Descriptive statistics of all numerical variables, including medians, interquartile range (IQR), together with the proportions of all categorical variables were calculated.

Results: Of the 41 cases 27 (65.9%) were male and 14 (34.1%) were female, 1 (2.4%), 4 (9.8%), 5 (12.2%), 19 (46.3%) and 12 (29.3%) were infant, toddler, preschool, school age and adolescent, respectively. Median time spent under the ruins was 30 hours. Cranial 5 (12.2%), spinal 2 (4.9%), limb 39 (95.1%), thoracic 1 (2.4%), abdominal 5 (12.2%), burn 1 (2.4%) trauma were present among patients and 17 (41.5%) of whom developed Crush syndrome. The American Society of Anesthesiologists (ASA) Score was assessed as 4 in 14 (34.1%), 3 in 17 (41.5%), 2 in 10 (24.4%) patients. Fasciotomy 23 (56.1%), wound debridement 31 (75.6%), cranial surgery 1 (2.4%), limb amputation 5 (12.2%), fracture fixation 3 (7.3%), spinal fixation 2 (4.9%) and reconstructive surgery 3 (7.3%) times were carried out in the operating room under sedation 8 (19.5%), general anesthesiology 7 (17.1%) or both 26 (63.4%). Subsequently, of the patients 7 (17.1%), 17 (41.5 %), 1 (2.4%), 2 (4.9%) were followed due to sepsis, acute kidney injury (AKI), osteomyelitis, and peripheral neuropathy, respectively. 31 (75.6%) patients were admitted to the intensive care unit (ICU) and 4 (9.8%) patients needed invasive mechanical ventilation after surgery, whose length of stay in ICU was 8 and all patients' median hospitalization days were 79. The percentage of exitus was 4.9%, remaining 39 (95.1%) were discharged (Table 2).

Conclusion: Ideal anesthetic management of these patients group may vary depend on available personnel, supplies and equipments.

Age (year), [median, (IQR)]	10 (5.5-13.5)
Infants	1 (2.4%)
Toddler	4 (9.8%)
Preschool	5 (12.2%)
School	19 (46.3%)
Adolescent	12 (29.3%)
Gender	
Male	27 (65.9%)
Female	14 (34.1%)

Hours under ruins [median, (IQR)]	30 (11.5-40)
First intervention at previous hospital	
Fasciotomy	25 (61%)
Limb amputation	5 (12.2%)
Diagnosis	
Cranial trauma	5 (12.2%)
Spinal trauma	2 (4.9%)
Limb trauma	39 (95.1%)
Thoracic Trauma	1 (2.4%)
Abdominal Trauma	5 (12.2%)
Burn	1 (2.4%)
Soft tissue injury	2 (4.9%)
Crush syndrome	17 (41.5%)
GCS on admission	
15	33 (80.5%)
14	4 (9.8%)
13	3 (7.3%)
8	1 (2.4%)
ASA score	
4	14 (34.1%)
3	17 (41.5%)
2	10 (24.4%)
Anesthesiology	
General	7 (17.1%)
Sedation	8 (19.5%)
Both	26 (63.4%)
Hospitalization days [median, (IQR)]	79 (42-82)
Surgical procedure	
Fasciotomy	23 (56.1%)
Wound debridement	31 (75.6%)
Total number	107
Cranial surgery	1 (2.4%)
Limb amputation	5 (12.2%)
Fracture fixation	3 (7.3%)
Reconstructive surgery	3 (7.3%)
Spinal fixation	2 (4.9%)
Complication	
Sepsis	7 (17.1%)
AKI	17 (41.5 %)
Osteomyelitis	1 (2.4%)
Peripheral neuropathy	2 (4.9%)
Days in ICU [median, (IQR)]	8 (1.5-24.5)
Invasive ventilation requirement	4 (9.8%)
Exitus	2 (4.9%)



Day 3_Room D

Abstract Presentation 3 (Virtual)

Chair(s): Jin Hee Ahn (Korea)
Sung-Ae Cho (Korea)

V3-1

Bispectral Index Relation with Delirium in Post Cardiac Surgery Patients

AFAD Abro

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Introduction: postoperative delirium is a common complication in post-cardiac surgery patients. It is a leading cause of death and a big burden on economic resources. There are three types of delirium hypoactive, hyperactive, and mixed. In this study, we have mentioned a case study of a patient who presented cardiac symptoms in Kaunas Clinics, LSMU. After cardiac surgery, the patient was diagnosed as delirious based on CAM-ICU features.

PICO Question: in post-cardiac surgery patients, can the monitoring of anesthesia depth during surgery reduce the risk of delirium? Research Questions: what are the main risk factors of postoperative delirium? How to monitor the anesthesia depth? What is the relation between intraoperative depth level and postoperative delirium?

Methodology of the Research: the main sources of the literature review were Google scholar and web of science, which led to PubMed, NCBI, ScienceDirect, and the American Journal of Anesthesiology. An inclusion and exclusion criterion was applied according to keywords; Bispectral-index relation with delirium in post-cardiac surgery patients (184), dexmedetomidine use for delirium with post-cardiac surgery (33), dementia vs. delirium after cardiac surgery (80), in this prospective research study the 67 number of publications are included from 2013-2023 which were directly related to the theme of this study. To fulfill the study aimed to understand the Bispectral index relation with delirium in post-cardiac surgery patients. For this purpose, a patient observed who had undergone total surgery under general anesthesia with the help of volatile and non-volatile drugs as well as the depth of anesthesia was monitored through BIS.

Result & Discussion: in this study, it is revealed through the case study, meta-analysis, and literature review that the perioperative Bispectral index monitoring decreases the chances of delirium postoperatively and dexmedetomidine diminishes the delirious symptoms without causing respiratory depression.

Conclusion: delirium assessment needs the preoperative proper assessment and evaluation of a patient and finding out which comorbidity may cause delirium postoperatively. CAM-ICU tool is the best tool to assess delirium. Correction of the cardiac biomarkers and physical ASA classification has a greater role in elderly populations who are prone to develop delirium after cardiac surgery. During cardiac surgery, BIS monitoring can reduce the chance of delirium by reducing volatile

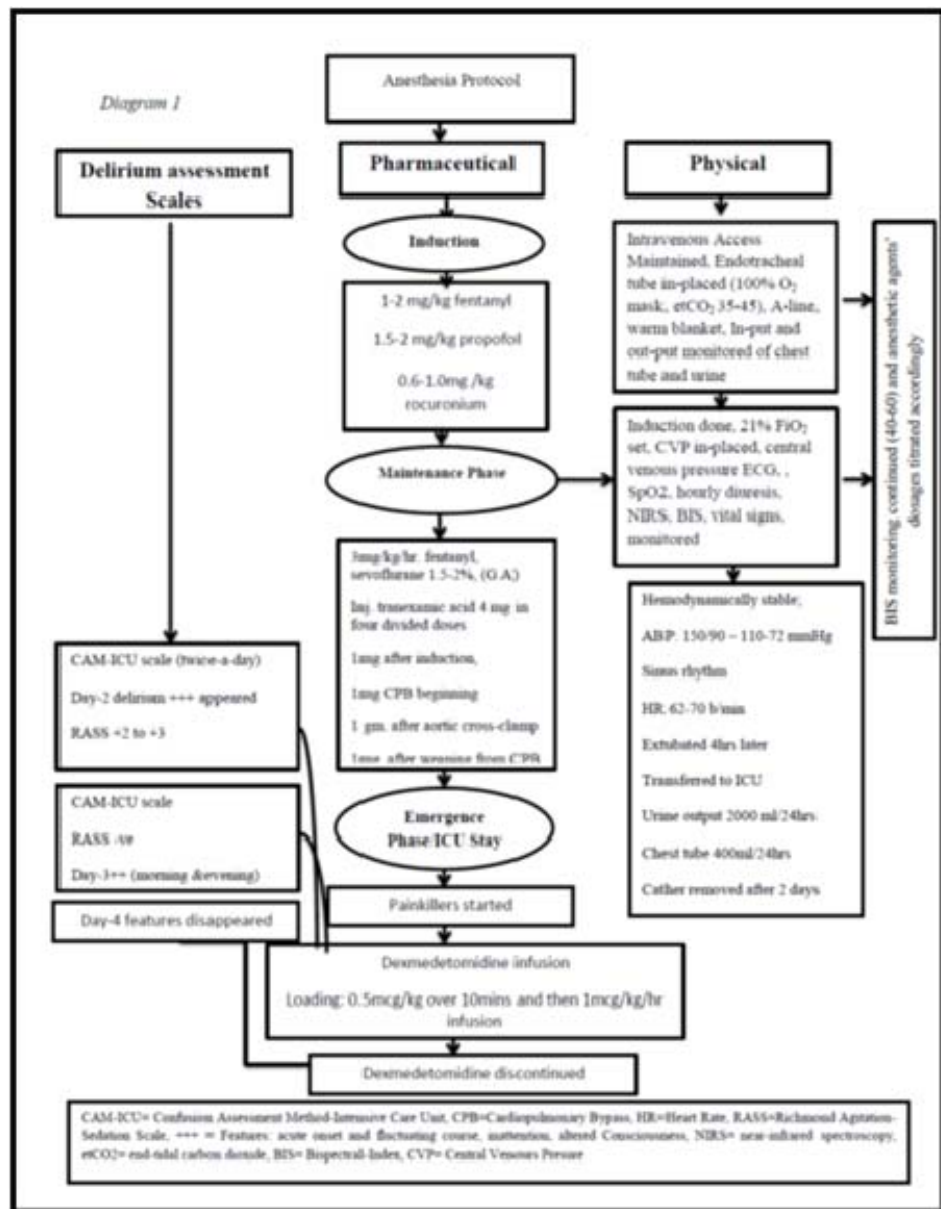


Table 3: Post-surgery delirium features appeared in the patient (Source: Author of study)

Postop day	acute onset and fluctuating course	inattention	altered C consciousness	disorganised thinking	Delirium
1 evening	⊗	⊗	⊗	⊗	⊗
2 morning	⊗	⊗	⊗	⊗	⊗
2 evening	⊙	⊙	⊙	⊗	⊙
3 morning	⊙	⊗	⊙	⊗	⊙
3 evening	⊙	⊗	⊙	⊗	⊙
4 morning	⊗	⊗	⊗	⊗	⊗
4 evening	⊗	⊗	⊗	⊗	⊗

Denotions: ⊗ = No, ⊙ = Yes

V3-2

The Impact of Oral Fluid Intake 1 Hour Prior to Surgery on Anxiety Levels and Gastric Volume in Pediatric Patients

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Background: Children and parents preparing for surgery often feel fear of the unknown, and hunger during the preoperative period adds to this anxiety. While preoperative fasting times have changed to allow clear liquid foods up to 1 hour before surgery, there is concern that this may increase the risk of aspiration. This study aims to investigate the effect of clear liquids given 1 hour before surgery on a child's anxiety and stomach volume during the preoperative period.

Materials and Methods: This study involved 90 pediatric patients aged 5-12 with ASA Scores of 1-2. They were divided into three groups: Group A (n=30) - standard fasting, Group S (n=30) - given 5 mL/kg (max 250 ml) of water orally 1 hour before, and Group K (n=30) - given 5 mL/kg (max 250 ml) of clear liquid rich in carbohydrates orally 1 hour before. Patients were evaluated with the modified Yale Preoperative Anxiety Scale (m-YPAS) before and 1 hour after receiving fluids. After intubation, the gastric antrum cross-sectional area (GACA) was measured, and gastric residual volume (GRV) values were calculated. Hemodynamic data, blood glucose levels, and parent satisfaction were recorded.

Results: One hour after the intervention, the measurements of m-YPAS were significantly lower in Group K than in Group S and Group A ($p<0.001$). The GACA and GRV values were significantly lower in the groups that received carbohydrate drinks and water compared to the fasting group ($p<0.001$). Parental satisfaction was highest in the group that received carbohydrate drinks.

Conclusion: Giving oral water and carbohydrate solution to children 1 hour before surgery reduces preoperative anxiety without increasing stomach volume. In fact, the intake of a carbohydrate solution is even more effective in reducing anxiety.

Improvement of Broviac Catheter-related Outcomes after the Implementation of a Quality Management System: A Before-and-after Prospective Observational Study

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Introduction: The tunneled Hickman-Broviac® catheter is widely used for neonates and young infants having difficult central venous access and requiring prolonged intravenous therapy, however, it needs surgical experience and nursing skills to prevent adverse outcomes. In our institution, high rates of catheter-related complications were previously observed. Because of the high rates of Broviac catheter complications, we started an urgent quality process to reduce this morbidity. The aim of this study is to assess the efficiency of the main actions we have taken in enhancing our practice and improving Broviac outcomes.

Methods: We included all neonates and young infants requiring surgical central venous access using a Broviac tunneled catheter. We compared the catheters' outcomes before and after the implementation of a quality program based on a nurse teaching program, patient selection, and catheter management multidisciplinary protocol. The significance threshold was set at $p < 0.05$.

Results: We included 94 patients: 51 in the protocol group and 43 in the control group. The complication rate was reduced from 60.3% to 25.5% with $p=0.001$. The lifetime of the catheter was improved from 11.3 ± 4.3 days to 19.1 ± 9 days with $p=0.007$. The catheter infection was reduced from 65.3% to 46.1% with $p \leq 0.001$.

Conclusion: This quality improvement project shows the utility of a quality assurance program based on careful indications and patient selection, a nursing teaching program, and a multidisciplinary catheter management protocol, in reducing Broviac catheter-related morbidity.

V3-4

Predictors of Perioperative Respiratory Adverse Events Among Children with a Cold Undergoing Pediatric Ambulatory Ilio-inguinal Surgery: Prospective Observational Research

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Background: Anesthesia for children with a cold has an increased risk of perioperative respiratory adverse events (PRAEs) that may be predicted according to the COLDS score. The aim of this study was to evaluate the validity of COLDS score in children undergoing ilioinguinal ambulatory surgery with mild colds and to investigate new predictors of PRAEs.

Methods: This was a prospective observational study including children aged from 1 to 5 years with mild symptoms of a cold proposed for ambulatory ilioinguinal surgery. The anesthesia protocol was standardized. Patients were divided into 2 groups according to the incidence of PRAEs. Multivariate logistic regression was performed to assess predictors for PRAEs.

Results: In this study, 216 children were included. The incidence of PRAEs was 21%. Predictors of PRAEs were respiratory comorbidities [aOR=6.3; 95%CI: 1.19-33.2; p=0.003], patients postponed before 15 days [aOR= 4.3; 95%CI: 0.83-22.4; p=0.029], passive smoking [aOR=5.31; 95%CI: 2.07-13.6; p=0.001], and COLDS score >10 [aOR=3.7; 95%CI: 0.2-53.4; p=0.036]

Conclusion: COLDS score was effective in predicting the risks of PRAEs even in ambulatory surgery. It seems that children with severe respiratory upper tract infections should be postponed for more than 15 days. Passive smoking and previous comorbidities were the main predictors of PRAEs in our population.

Intra Operative Fat Embolism in a Child With Osteogenesis Imperfecta -Double Whammy!

Snehal Tare¹, Nandini Dave²

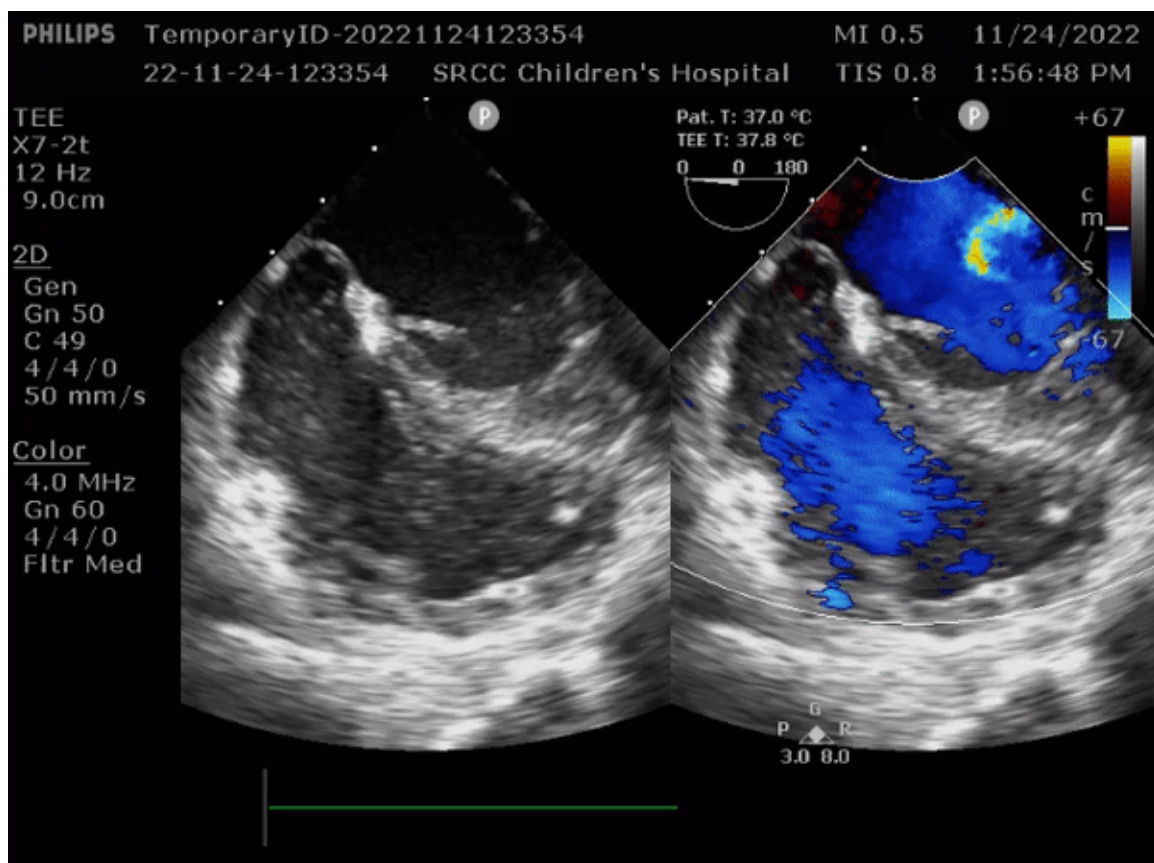
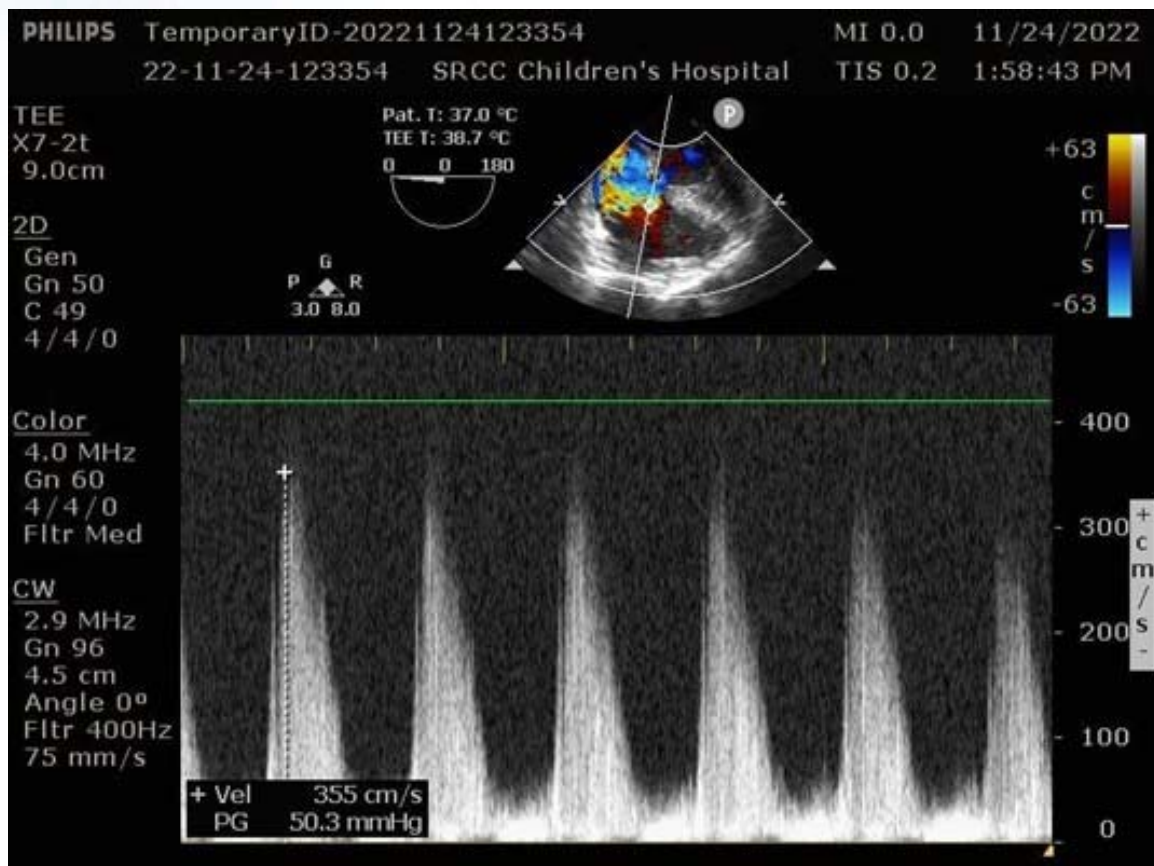
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Background: Osteogenesis imperfecta is an uncommon hereditary connective tissue disorder distinguished by fragile bones, hearing loss, defective dentition, and blue sclera. Difficult intravascular access, potentially difficult airway, pulmonary compromise, risk of intraoperative bleeding and hyperthermia are some of the many challenges for the anaesthetist. Fat embolism syndrome is rare in paediatric age group. It's a fatal complication of femur nailing surgery and is always diagnosed as an outlier; it may require cardiopulmonary support. This report describes an intraoperative fat embolism syndrome that occurred during intramedullary femur nailing in a young patient with osteogenesis imperfecta.

Case Description: A 11-year-old male with osteogenesis imperfecta and severe scoliosis, short stature, multiple limb deformities and obstructive sleep apnea; was scheduled for bilateral femoral osteotomies. Intraoperatively there occurred severe cardio-respiratory collapse during advancement of femur nail. The event included, a sudden drop in ETCO₂, hypotension, increased airway pressure with inability to ventilate, desaturation and bradycardia. Worsening of cardio-respiratory parameters led to pulseless electrical activity which needed cardiopulmonary resuscitation and adrenaline. A diagnosis of fat embolism syndrome was confirmed with transesophageal echocardiography and by eliminating other differentials. A successful ROSC was achieved followed by completion of surgery and postoperative stabilization.

Discussion: Most popular existing diagnostic criterias for FES are designed for spontaneously breathing, awake patients. Under general anaesthesia, diagnosing a fat embolism is challenging since the symptoms are obscured. In our case, management was also a challenge due to the high fragility of bones in osteogenesis imperfecta.



Risk Factors for Hickman-Broviac Catheter Complications: The Experience of a Tunisian Hospital

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Introduction: Hickman-Broviac catheters have improved the care of young children needing frequent and prolonged venous access at the cost of substantial morbidity, particularly in the developing countries. The aim of our study is to describe the experience of a Tunisian hospital and to look for the main risk factors for complications.

Methods: In this prospective observational study, we included all neonates and infants aged less than 12 months who were proposed for catheter Broviac insertion in the pediatric surgery department. Patients were divided into 2 groups according to the incidence of complications. Then, we compared the two groups. Univariate logistic regression analyses were used to determine the risk factors for complications.

Results: forty-three children were included in the study. The incidence of complicated catheters was 60.4%. The following factors were significantly associated with an increased risk of complications: age 6 months [OR 3.5, 95% CI: 0.6-19.3], weight 6 kg [OR 1.54, 95% CI: 0.46-5.2], emergency circumstances [OR 1.62, 95% CI: 0.8-5.4], and anti-biotherapy as an indication for Broviac catheter insertion [OR 1.8, 95% CI: 0.5-6.2].

Conclusion: Complications seem to be more frequent in patients younger than 6 months and those with a low weight of less than 6Kg and to reduce the morbidity related to the catheters, the indications should be carefully chosen.

V3-7

Complications and Risk Factors of Percutaneous Subclavian Vein Catheters in Pediatric Patients: Enhancing the Outcomes of a University Hospital in a Developing Country

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Purpose: Assessing central venous catheter-related complications with regular feedback and investigating risk factors is mandatory to enhance outcomes. The aim of this study is to assess our experience in the management of pediatric subclavian vein catheters (SVCs) and to investigate the main risk factors for complications.

Materials and Methods: In this prospective observational research, we included 3 months to 14 years children proposed for infraclavicular subclavian vein catheterization consecutively using the anatomic landmark technique. Patients were divided into 2 groups: Group 1 included complicated catheters and Group 2 included non-complicated catheters. The management protocol was standardized for all patients. After comparing the two groups, univariate and multivariate logistic regression were used to investigate the risk factors for complications.

Results: In this study, we included 134 pediatric patients. The rate of complications was 32.8%. The main complications were: Central Line-associated Bloodstream Infection (63.6%); bleeding and/or hematoma (22.7%); mechanical complications (13.6%); and vein thrombosis (13.6%). After adjustment for confounding factors, predictors of catheter-related complications were: difficult insertion procedure [aOR=9.4; 95%CI: 2.32-38.4], thrombocytopenia [aOR=4.43; 95%CI: 1.16-16.86], and comorbidities [aOR=2.93; 95%CI: 0.58-14.7]

Conclusion: High rates of complications were associated with difficult catheter placement and patients with comorbidities and severe thrombocytopenia. To reduce catheter-related morbidity, we suggest ultrasound guided approach, a multidisciplinary teaching program to improve nursing skills, and the use of less invasive devices for cancer patients.

Implementation of “Goal Directed Bleeding Management” at Shahid Gangalal National Heart Center

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Patient Blood Management (PBM) is a proactive, patient-centered, and multidisciplinary approach to manage anemia, optimize hemostasis, minimize iatrogenic blood loss, and harness tolerance to anemia.

World Health Organization has endorsed PBM in 2010, many hospitals still seek guidance with the implementation of PBM in clinical routine.

Coagulation management of patients undergoing cardiac surgery is complex. A balance between anticoagulation for cardiopulmonary bypass (CPB) and hemostasis after CPB. Patients have impaired platelet function at baseline due to administration of anti-platelet agents.

After surgery, coagulation abnormalities, platelet dysfunction and fibrinolysis can occur, creating a situation whereby hemostatic integrity must be restored. The complex process of anticoagulation with heparin, antagonism with protamine, and postoperative hemostasis therapy can be guided by point-of-care (POC) tests that assess hemostatic function in a timely and accurate manner.

Looking at the progress worldwide, multi-disciplinary team at Shahid Gangalal National Heart Center (SGNHC) took initiative to enhance knowledge about principles and practices of PBM. The concept of early, individualized and goal-directed bleeding management (GDBM) is practiced in cardiac operations at SGNHC using rotational thromboelastometry(ROTEM), a newer modality started in the country from 2022.

GDBM will change empirical blood and blood product transfusion that would decrease the cost, complications and casualties related to both transfusion and bleeding.

Despite the demonstrated benefits of PBM, many barriers and challenges limit translation of PBM guidelines into clinical practice, staffs don't know about the latest guidelines and consequences of the blood transfusion. There is standard dogma that “one size fits all ”. Lack of knowledge of the physicians, lack of interdisciplinary commitment, lack of resources (hospital administrators need to invest initially before saving money)and other general concerns are rest to be named.

ROTEM is not designed to answer “Will the patient bleed” But “Why does the patient bleed”. We should not treat pathologic laboratory results ‘numbers’ in the absence of bleeding. If both, POC viscoelastic (ROTEM) and platelet function testing (ROTEM) are normal, surgical bleeding has to be considered and treated adequately.



Day 3_Room D

Abstract Presentation 4 (Virtual)

Chair(s): Eun-Young Joo (Korea)

Woo Suk Chung (Korea)

The Utility of Enhanced Recovery After Surgery (ERAS) Protocols in Adolescent Scoliosis Surgery: A Systematic Review and Meta Analysis

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Background: Posterior spinal fusion (PSF) for adolescent idiopathic scoliosis (AIS) is the most invasive orthopaedic surgical procedure in the pediatric age group with profound perioperative stress. The efficacy and feasibility of ERAS protocols to enhance recovery and improve outcomes of PSF surgery in AIS patients are yet to be established.

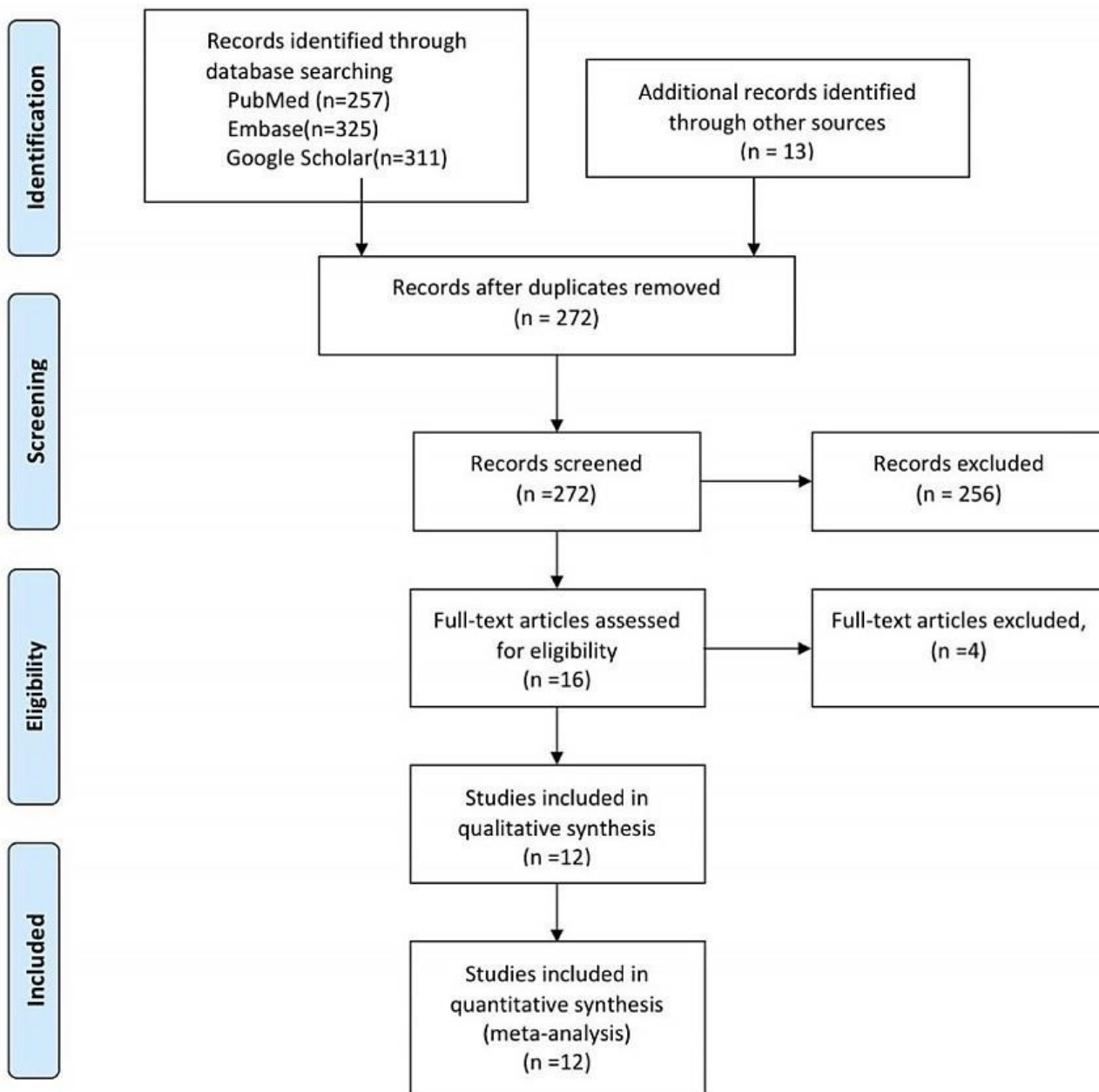
Methods: Controlled cohort studies and randomized control trials comparing enhanced recovery pathways with conventional pathways in AIS undergoing PSF at adolescent age were included. The inverse variance and Mantel-Haenszel statistical analysis methods were used for continuous and dichotomous data, respectively. All results were quantitatively analyzed using the random effect model.

Results: 12 studies, including 13886 patients undergoing PSF at adolescent age for AIS were included. Patients in the ERAS group had a significant reduction in LOHS by an average of 1.61 days (95% CI -1.25 to -1.97, I² = 96%), blood loss by 281.93 ml (95% CI -74.88 to -488.98, I²=96%), duration of surgery by 52.81 minutes (95% CI -25.97 to -79.65, I² 88%), pain scores-NRS by 1.20 (95% CI -0.75 to -1.65, I²=58%), PCA duration by 1.38 days (95% CI -0.70 to -2.06, I²=96%) without any significant difference in complications (OR 0.53, 95%CI 1.01-0.28, I²=54%), readmission rates (OR 1.57, 95%CI 0.77-3.22, I² =7%), PONV (OR 0.42, 95% CI 0.09-1.95, I² =91%), cost with a mean difference of 2721.55 \$ (95% CI -4987.34 to 10430.45, I²=93%) and opioid consumption -3.14 mg(95% CI -10.81 to 4.53, I² =79%) compared to the traditional protocol group.

Conclusion: Implementation of ERAS protocols in AIS patients undergoing PSF results in enhanced recovery without a considerable increase in complications, readmission rates, opioid consumption, cost, and PONV compared to traditional protocols. Thus, the formulation of standardized ERAS protocols for scoliosis surgery is necessary.

AUTHOR/ YEAR	STUDY DESIGN	COUNTRY	SAMPLE SIZE (n)	PROTOCOL NAME	PRIMARY OUTCOME
Fletcher <i>et al</i> ³⁴ 2014	Retrospective cohort	USA	279	AD	Clinical & economic implications of accelerated discharge
Gornitzky <i>et al</i> ³⁵ 2016	Retrospective cohort	USA	138	RRP	RRP improves pain control, reduces opioid- related complications and expedites early mobilization
Rao <i>et al</i> ³⁶ 2016	Retrospective cohort	USA	190	-	Educating preoperatively and standardizing care decrease the time to discharge
Sanders <i>et al</i> ³⁷ 2016	Retrospective cohort	USA	284	AP	Average hospital stay
Fletcher <i>et al</i> ³⁷ 2017	Retrospective cohort	USA	150	AD	Impact of the novel postop pathway on length of stay and complications
Kim <i>et al</i> ³⁸ 2017	Prospective cohort	USA	72	NP	New protocol improves patient experience, lowers the length of hospital stay and cost
Yang <i>et al</i> ³⁹ 2020	Retrospective cohort	China	79	ERAS	Impact and feasibility of optimised ERAS pathway
DeVries <i>et al</i> ⁴⁰ 2020	Retrospective cohort	USA	244	RRP	Feasibility to implement RRP for surgical treatment of AIS
Fletcher <i>et al</i> ⁴¹ 2021	Retrospective cohort	USA	276	ERAS	To compare immediate postoperative outcomes following an ERAS pathway
Ding <i>et al</i> ⁴² 2022	Retrospective cohort	China	90	ERAS	Feasibility and efficacy of ERAS protocol in AIS
Tondevold <i>et al</i> ⁴³ 2022	Retrospective cohort	Denmark	154	ERAS	LOHS, Transition to solid foods, PONV
Shaw <i>et al</i> ⁴⁴ 2022	Retrospective cohort	USA	12010	ERAS	LOHS and total treatment charge

Table 1: LOHS= length of hospital stay , LOE= level of evidence, ERAS= Enhanced recovery after surgery, AD= Accelerated discharge, RRP= Rapid recovery pathway, NP= New protocol, AIS= Adolescent idiopathic scoliosis.



V4-2

Comparison of Ultrasound Guided Thoracic Paravertebral Block Versus Serratus Anterior Plane Block in Children Undergoing Thoracic Surgery: A Prospective Observational Study

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Background: Thoracic paravertebral block (TPVB) and serratus anterior plane block (SAPB) are two truncal blocks that are alternative to thoracic epidural block in thoracic surgery. In the current study, it is aimed to compare the effects of ultrasound (US) guided TPVB and US guided SAPB on postoperative pain and opioid consumption in pediatric thoracic surgery population.

Methods: After obtaining ethics committee approval, 46 children whose legal guardians provided consent (1-14 years old) and were scheduled for lung resection were included in the study. TPVB (Group T) and SAPB (Group S) were performed prior to incision with 0.5 ml/kg or 0.4 ml/kg bupivacaine, respectively. The primary outcome was total intravenous (IV) morphine consumption in postoperative 48 hours. Secondly, FLACC scores (Face, Legs, Activity, Cry, Consolability) were evaluated at postoperative 0th, 15th, 30th, 45th minutes and at 1st, 2nd, 6th, 24th, and 48th hours. If the FLACC score was >4 , 0.03 mg/kg morphine IV was administered as rescue analgesia. Other types of analgesics were not provided since a strong opioid was chosen along with truncal block. Time to first morphine administration (minutes), time to first mobilization (minutes), length of hospital stay (hours), postoperative vomiting (POV) incidence (%), and chronic pain incidence (%) were also recorded. Chronic pain was evaluated three months after the surgery.

Results: Total 40 patients were included. Demographic data, ASA physical status scores and duration of surgery were similar in both groups ($p>0,05$). Morphine consumption during postoperative 48 hours was higher in Group S (0.24 ± 0.07 mg/kg) than in Group T (0.17 ± 0.08 mg/kg) ($p=0,01$). Time to first morphine administration was shorter in Group S comparing to Group T ($205,5\pm68,7$ min vs $356,7\pm83$ min, respectively, $p<0,001$). Both groups did not differ with regards to intraoperative fentanyl consumption, time to first mobilization, length of hospital stay, POV incidence, and chronic pain incidence ($p>0.05$). (Table 1). During the postoperative two hours, FLACC scores were statistically close between two groups ($p>0.05$). However, in Group S, postoperative 6th, 12th, and 24th hours FLACC scores were significantly higher. ($p=0.01$ $p=0.02$ $p<0.001$) (Table 2).

Conclusion: This study demonstrated that both US-guided SAPB and US- guided TPVB provided effective post-

operative analgesia in early postoperative hours in pediatric patients undergoing thoracic surgery. However, after postoperative 6th hour, TPVB was superior to SAPB in terms of FLACC scores, postoperative morphine consumption and time to first analgesic requirement.

Table 1: Brief summary of demographic and perioperative period data including pain-related details.

	Group S (n=20)	Group T (n=20)	p
Female (n) (%)	10 (50%)	4 (20%)	0.04
Age (Years)	7,38±4.56	8±4,75	0.67
Weight (kg)	29,85±17,14	33,20±18,57	0.56
ASA I/II/III	3 (15%) / 16 (80%) / 1 (5%)	5 (25%) / 14 (70%) / 1 (5%)	0.73
Duration of surgery (min)	106±18,25	115±22,83	0.18
Patient number requiring intraoperative additional fentanyl (n) (%)	13 (65%)	9 (45%)	0.34
Patient number requiring rescue analgesia (n) (%)	20 (100%)	18 (90%)	0.49
Time first morphine administration in the postoperative period (min)	205,5±68,71	356,67±82.96	<0,001
Total morphine consumption in the postoperative 48 hours (mg/kg)	0,24±0,07	0,17±0,08	0.01
Time to first mobilization in the postoperative period (Hours)	23,75±21,49	27,50±24,05	0.61
Length of hospital stay (Hours)	121,2±41,55	109,2±38,5	0.35
Postoperative vomiting incidence (n) (%)	4 (%20)	1 (%5)	0.34
Chronic pain incidence in postoperative 3 rd month (n) (%)	1 (%5)	1 (%5)	1

Table 2: Postoperative FLACC scores. FLACC: Face, Legs, Activity, Cry, Consolability.

Postoperative FLACC scores	Group S (n=20)	Group T (n=20)	<i>p</i>
0th minute	2 (2-2)	2 (1-2)	0.77
15th minute	2 (2-2)	2 (1-2)	0.35
30th minute	2 (1-3)	2 (1-3)	0.89
45th minute	1 (1-3)	2 (1-3)	0.64
1st hour	2 (2-2)	2 (2-3)	0.81
2nd hour	2 (2-3)	2 (2-3)	0.84
6th hour	3 (3-4)	2 (2-3)	0.01
24th hour	3 (2-4)	2 (1-3)	0.02
48th hour	2 (2-3)	1 (0-1)	<0,001

Procedural Sedation and Anaesthetic Technique in Paediatric Patients with Anterior Mediastinal Mass in a Quaternary Centre - Our 3 Years of Experience

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Background: Anaesthetic management of children with anterior mediastinal mass (AMM) is challenging. Due to its proximity to airway and major cardiovascular structures, patients may present with cardiorespiratory compromise. Anaesthesia or sedation is often required for urgent diagnostic or therapeutic procedures. While classical teaching suggests avoidance of general anaesthesia (GA), data on anaesthetic or sedation techniques and their outcomes is lacking.

Methods: We performed a retrospective review of anaesthetic records of all patients with AMM presenting to our hospital for procedure under sedation or anaesthesia from June 2019 to May 2022.

Results: 22 patients underwent a total of 34 procedures at Hong Kong Children's Hospital between June 2019 and May 2022. Twenty-eight procedures (82%) were image guided biopsies, bone marrow aspiration, insertion of vascular access, drainage of pleural or ascitic fluid. The remaining were tumour excision and emergency appendectomy. In 22 patients, only 13 patients had preoperative vascular or airway obstructive symptoms. However, 18 patients had major airway or vascular compression on imaging. Symptoms and degree of airway or vascular compression did not correlate. 25 procedures were done under monitored anaesthetic care (MAC) and all were successful. Sedation was provided by paediatric anaesthesiologist using agents included dexmedetomidine, ketamine, propofol and fentanyl. Eighteen episodes required low or high flow nasal oxygen but none required assisted ventilation or advanced airway. Six procedures were done under GA. Among these, two were done with spontaneous ventilation and laryngeal mask airways. Four were done with muscle relaxants. Two patients had non-compressing tumours and received paralysis upon induction. The other two with significant airway and vascular compression were paralysed only when sternum was opened and tumour controlled by surgeons. However, they still developed significant haemodynamic instability requiring inotropes and one of them even required extracorporeal membrane oxygenation (ECMO). Three adolescents had local anaesthesia for peripheral body parts biopsies.

Conclusion: Paediatric AMM cases present with great anaesthetic challenges. A multidisciplinary approach to streamline the diagnostic and therapeutic workflows, good case selection and experienced anaesthetists and cardiothoracic surgeons allow urgent diagnostic or therapeutic procedures to be safely performed.

V4-4

Distraction Techniques for Post-operative Paediatric Patients in Post Anaesthesia Care Unit (PACU); A Randomized Control Trial

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Introduction: Paediatric pain is complex involving physiological, behavioural, and development factors. Non-pharmacological therapies can be used to treat the affective, cognitive, and behavioural dimensions of pain (1). But its use in postoperative anaesthesia care unit (PACU) is still limited. This study aimed to compare the distraction method with the conventional pharmacological method in paediatric pain scores and parent's satisfaction after surgery.

Methodology: This parallel randomized control trail was conducted at PACU of a tertiary care hospital by including all elective paediatric patients of age 3 to 7 years. Patients were divided into two equal groups i.e. 22/group by computer generated random numbers. The control group (C) received conventional analgesia while experimental group (CD) received distraction technique as well as routine. After obtaining the informed consent, data was collected in PACU at four time points on a predesigned form. Faces pain scale was used to score pain in both groups. The groups were compared using independent t-test/Mann Whitney U test and Fisher's exact test.

Results: Forty- four paediatric children of 4.6 (1.45) years participated in the study. 54.5% received only caudal analgesia. Intraoperative systemic analgesics include paracetamol in 18 (40.9%) patients, nalbuphine in 2 (4.5%), and both paracetamol & nalbuphine in 11 (25%) patients. In group CD, children chose to play games (9%), to listen poems (13.6%), and to watch cartoons (27.3%). The heart rate at 20 minutes (p-value 0.021) and pain score at 20 minutes (p-value 0.049), 60 minutes (p-value 0.05) and parent satisfaction (p-value 0.003) were statistically significantly.

Conclusion: Distraction technique was found to be superior to conventional paediatric pain management in PACU.

Key Words: distraction techniques, paediatric pain, pain management, PACU

Perioperative Anaesthetic Management of Button Battery Ingestion: A Case Report

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The ingestion of button batteries by paediatric patients is not uncommon. It has been reported >3500 ingestions annually and 12.6% of children <6 years old develop serious or fatal injuries including damage to esophagus, adjacent airway, vascular and mediastinal structures. Due to the rapid development of these corrosive injuries, treatment protocols and guidelines have been published. These protocols emphasises on emergent removal of button battery to limit the ongoing damage caused by it. However, this is not always possible due to delays in initial or atypical patient presentation and/or need for transfer to a paediatric facility for removal of the button battery. This case report describes the perioperative anaesthetic management of a 14 month old infant who presented to ED with worsening respiratory symptoms for 5 days with incidental finding of button battery ingestion by CXR, complicated with acquired tracheoesophageal fistula and the challenges that came with it. Recommendations from current guidelines of button battery ingestion including risk stratification of patients and its intraoperative anaesthetic management are discussed. Anaesthetists should be aware of potential complications and risk stratify the patients to provide appropriate perioperative management and care coordination for the patient. Care by multidisciplinary team and prompt interventions are key to a successful outcome.



High Risk	Intermediate Risk	Low Risk
<ul style="list-style-type: none"> • Children <5 years old • Battery >20-mm diameter • Underlying esophageal pathology or stricture • Esophageal impaction <ul style="list-style-type: none"> – at the level of the aortic arch – with the negative pole (narrow side) facing posteriorly – prolonged impaction • Signs of gastrointestinal bleeding 	<ul style="list-style-type: none"> • Esophageal impaction not meeting high-risk criteria • Symptomatic gastric button batteries 	<ul style="list-style-type: none"> • Children >5 years old • Battery <20-mm diameter • No history of esophageal pathology or stricture • Asymptomatic gastric button batteries

Computed Tomographic (CT) Scan Measurements of Anatomical Landmark for Suprazygomatic Maxillary Nerve Block in Children

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Maddi Sarath Kumar², Aanchal R Bharuka¹

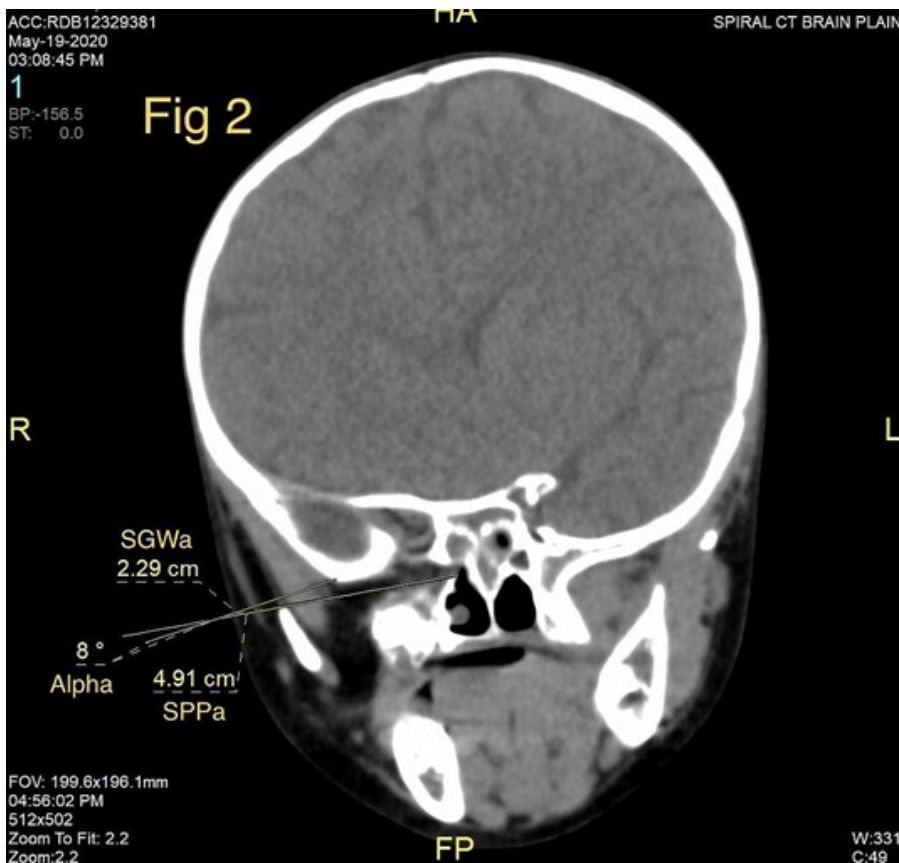
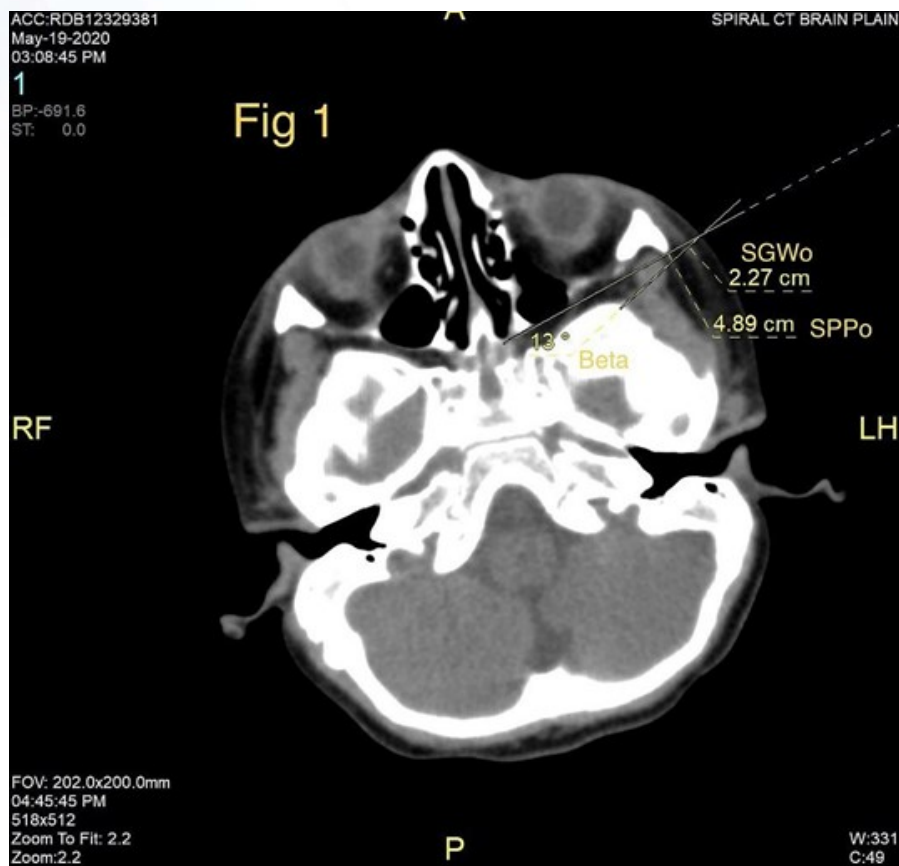
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Background: Maxillary nerve block is used as a part of multimodal analgesia for cleft palate surgery. Suprazygomatic approach for maxillary nerve block is preferred, as it avoids injury to the eye and base of the skull. Effective analgesia depends on exact positioning of the needle. Measurements of anatomic landmark have been described in infants of Caucasian origin but not in children of Asian origin. Hence, we studied CT guided anatomical landmark for suprazygomatic maxillary nerve block in our pediatric population.

Method: In this retrospective observational study, data of children of Asian (Indian) origin aged 1-5 years who underwent CT brain in our hospital were analyzed. Exclusions were those with facial malformations. The distance from skin to greater wing of sphenoid process and distance from skin to medial end of pterygopalatine fossa in both axial and coronal oblique view, the angles (α , β) between them were measured. The distance from skin to deep end of temporalis muscle (ST) was measured.

Results: 30 consecutive CT scans meeting the selection criteria were analyzed there were 19 (63.33%) males; mean \pm SD age of the children was 30.63 ± 11.94 months (range 12-50 months). Mean \pm SD distance from skin to greater wing of sphenoid in axial (SGWa) and coronal oblique (SGWo) view were 29.93 ± 0.21 mm, and 22.42 ± 1.83 mm, respectively. Mean \pm SD distance from skin to medial end of pterygopalatine fossa (SPP) in axial (SPPa) and coronal oblique (SPPo) view were 46.24 ± 2.47 mm, and 43.98 ± 0.49 mm, respectively. The anterior angle between SGWa and SPPa (α) was $9.13 \pm 2.909^\circ$. The inferior angle between SGWo and SPPo (β) was $7.266 \pm 0.707^\circ$. Figs 1 and 2 shows SGWa, SPPa, α in axial view and SGWo, SPPo, β in coronal oblique view respectively. Mean \pm SD depth from skin to deep end of temporalis muscle (ST) was 23.21 ± 6.27 mm. There was no significant correlation with age and gender.

Discussion: CT measurements guide us to reach the maxillary nerve in pterygopalatine fossa, for precise deposition of local anesthetic and the measurements may vary with ethnicity. Our study provides distances and angles for anatomical landmark based suprazygomatic maxillary nerve block. However, these need to be validated clinically.



A Balancing Act of Survival: A Case Report on the Anesthetic Management of an Ex Utero Intrapartum Procedure

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The Ex Utero Intrapartum Treatment (EXIT) procedure is a rare technique conducted in conjunction with an elective Cesarean Section. The goal is to safely deliver a fetus with a severe congenital airway abnormality. This case report describes the anesthetic management of an EXIT procedure conducted in a 29 year old primigravid in threatened labor of a 30 week old fetus with a cervical teratoma. An EXIT procedure is distinct in its anesthetic management as it must involve careful planning from both the maternal and fetal perspectives. Maintaining adequate uteroplacental circulation through uterine relaxation is a vital cornerstone of management for both mother and fetus. Maternal considerations also include adequate analgesia, prevention of uterine atony and bleeding. Fetal considerations include adequate anesthesia and analgesia, continuous fetal monitoring, preparation for resuscitation measures and fetal airway management.

V4-8

Postoperative Sedation and Analgesia in Pediatric Cardiac Surgery

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Relevance: The desire to provide an optimal method of sedation and analgesia has led to the improvement of multimodal methods of anesthesia. One of the safest methods of anesthesia for children is the use of non-narcotic drugs.

The Goal of Study: The aim of our study was a comparative assessment of the efficacy and safety of the use of dexmedetomidine in combination with paracetamol in children after cardiac surgery.

Materials and Methods of Research: The study included 65 children aged 2 to 4 years with congenital heart defects. The patients were divided into 2 groups. group 1, main (n = 35), where patients started intravenous infusion 30 minutes after surgery dexmedetomidine with a loading dose of 1.0 mcg/kg/h for 10 minutes followed by an infusion at a rate of 0.8 mcg/kg/h during the day against the background of planned postoperative analgesia with acetaminophen (Infulgan, 15 mg/kg, intravenously, bolus) 2 hours after the operation and subsequent every 8 hours during the day. Group 2, control group (n = 30), for analgesia, morphine 0.3 mg/kg was used, intramuscularly, the initial dose was 2 hours after the operation. Both groups were homogeneous in terms of surgical pathology, age, body weight, and duration of surgery. studied all patients in the following stages: 1-stage 2 hours after surgery, 2-stage 8 hours after surgery, 3-stage 16 hours, 4-stage after 24 hours. During the first day after the operation, the patient's condition was monitored, blood pressure, heart rate, blood gases, mechanical ventilation parameters or spontaneous respiratory rate, pulse oximetry were recorded; assessment of the level of sedation according to the RASS- scale (Richmond arousal-sedation scale), assessment of the intensity of pain according to the FLACC behavioral scale .

Results: In the course of the study, in all children, hemodynamics remained stable, within the age norm. By the 4th stage of the study, patients of group 2 showed an increase in hemodynamic and respiratory parameters, which required repeated administration of morphine in order to treat postoperative pain. In this group, a high incidence of complications was noted: vomiting (16.6%), pruritus (13.3%), intestinal paresis (10%), urinary retention (6.7%).

Conclusions: Thus, dexmedetomidine in combination with acetaminophen provides adequate sedation, early extubation, prevents psychomotor agitation, prolongs analgesia and promotes early natural feeding feeding in patients with cardiac surgery profile.

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