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**Session Thursday**



## **46/ANESTHETIC MANAGEMENT AND OUTCOMES IN PATIENTS TREATED WITH STENT COLOCATION FOR SUPRAVALVULAR AORTIC STENOSIS**

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**Objective:** To review the perioperative management and outcomes in patients that underwent endovascular stent-graft colocation for congenital supravalvular aortic stenosis (SVAS).

**Study design:** Retrospective review of the patients scheduled at our institution from November 2009 through March 2010 to realize endovascular stent colocation for SVAS. The SVAS was diagnosed with the use of echocardiography, cardiac catheterization or cardiac magnetic resonance imaging.

**Results:** The study group was 4 male patients with ages from 6 to 12 years old. Two of them diagnosed of Williams Syndrome. All of them had general anesthesia with intravenous inductions and mechanical ventilation (3 orotracheal intubation, 1 laryngeal mask). All the procedure took from 120 to 227 minutes. The procedures were executed by femoral arterial access (3 right and 1 left). One of the patients (25%) presented hypotension (63,02% from the basal tension) after aortic stent colocation as a unique complication which resolved with volume infusion. All the patients were awakened and extubated at the catheterization laboratory and transported for the postoperative care to the PICU. The postoperative evolution was unremarkable and the patients were discharged home in the next 48 hours. One hundred per cent required reintroduction of anti-hypertensive drug within the first 24 hours post stent colocation. The systolic gradient after the stent colocation was reduced to less than 10mmHg in all cases.

**Conclusions:** The treatment of the SVAS by endovascular stent-graft colocation at the catheterization laboratory has allowed to reduce hospital staying and anesthetic and surgical morbidity in these patients. However, this is a new technique which needs to be followed in the time to see the outcome of these patients.



## 49/PERIOPERATIVE ANESTHETIC MANAGEMENT OF CHILDREN WITH SPINAL MUSCULAR ATROPHY UNDERGOING SCOLIOSIS SURGERY

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**Introduction.** Spinal muscular atrophy (SMA) is a group of neuromuscular diseases caused by the degeneration of anterior horn cells of spinal cord and brain stem. The most common form is chronic infantile form (type II) with progressive symmetric proximal weakness, hypotonia, fasciculations and difficulties in sitting independently by the age of 1. However, sensory functions and mental status are normal. Scoliosis surgery is probably the most complicated procedure among multiple interventions. We aimed to report our anesthetic managements of 3 patients with SMA type II who underwent scoliosis surgery.

**The Patients.** One female (11 years) and two male (13 and 10 years) patients with Mallampati class I airway were scheduled for the surgery. Pulmonary function tests indicated mild restrictive pattern. Cardiovascular functions and blood tests were normal. One unit of autologous blood was donated from patients and allogeneic blood products were prepared.

**Anesthetic management.** All patients were premedicated with midazolam and ranitidine. Anesthesia was induced with propofol and fentanyl. We didn't use neuromuscular blocking agents due to a possible hypersensitivity and succinylcholine induced hyperkalemia. A bolus dose of 3 mcg.kg<sup>-1</sup> remifentanyl was given to facilitate endotracheal intubation and an armored ETT was placed. Two large peripheral venous catheters, a central venous catheter, an invasive arterial catheter, an urinary catheter and an esophageal temperature probe were placed. The patients were placed prone over a frame on the operating table that allows adequate ventilation and avoids compression of the inferior vena cava. A special headrest, a pillow for the lower legs, arm boards and padding were used against compression. Spinal cord functions were monitored with SSEPs and MEPs. The patients were warmed with air warming devices.

Anesthesia was maintained with infusions of propofol and remifentanyl instead of volatile anesthetics and nitrous oxide which are known to induce malignant hyperthermia and to affect SSEPs. Nitroglycerin infusion was used for controlled hypotension. The blood loss and fluid therapy were assessed with urine output, regular blood gas analysis and vital signs. Median two units of blood and fresh frozen plasma were given during the operation.

At the end of the surgery, the surgeon placed an epidural catheter under direct vision into the epidural space at the T9-10 interspace. The patients were placed supine and ETT was removed after obtaining adequate ventilation confirmed with blood gas analysis. An infusion of epidural PCA with bupivacaine and fentanyl was started.

All patients were followed one night in the ICU and discharged at 5. or 6. postoperative days without complications.



**Conclusion.** The anesthetic management of scoliosis surgery in patients with SMA involves a combination of many techniques. Anesthesiologists should complete a careful anesthetic plan for possible complications which may be faced at every step during the procedure.



### 34/Risk factors for unsuccessful complication management in paediatric anaesthesia

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**Background:** Anesthesiologists in peripheral hospitals do a small number of infant intubations. This increases the probability of complications. Arul, GS: Arch Dis Child 1998;79:65-72

**Method:** Case report. We report an oesophageal intubation in a three-month-old infant that remained unrecognized for about one hour. Using the PRISMA approach (Prevention and Recovery Information System for Monitoring and Analysis; [www.who.int/patientsafety/taxonomy/PRISMA\\_Medical.pdf](http://www.who.int/patientsafety/taxonomy/PRISMA_Medical.pdf)) we try to identify root causes for this incident.

**Results:** We discuss the need for both personal skills training and crew resource management training on a regular basis. Furthermore a critical look is taken at the trend of centralizing paediatric anaesthesia, leaving peripheral hospitals with an even lower case load of infant intubations.



## 48/Laryngospasm Followed By Negative-Pressure Pulmonary Edema: When One Complication Doesn't Come Alone

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**Introduction:** Laryngospasm consists of a prolonged glottis closure mediated by the superior laryngeal nerve and is often self-limiting as hypoxia and carbon-dioxide retention abolishes the reflex, otherwise the potential for pulmonary aspiration and negative-pressure pulmonary edema (NPPE) increases. It is more common in children (17.4/1000) than in the general population (8.7/1000), especially those with upper respiratory infection<sup>1</sup>.

**Case report:** 14 year-old male, ASA I, unremarkable prior history, scheduled for urgent surgical drainage of a peritonsillar abscess. Endovenous premedication: midazolam-2mg, ranitidine-50mg, metoclopramide-10mg, hydrocortisone-200mg. Induction: fentanyl-2mg/Kg, propofol-2mg/kg, rocuronium-0,6mg/Kg, followed by promptly intubation. Maintenance: O<sub>2</sub>:air (40:60) and sevoflurane 2-3%. Surgery lasted for 35min, uneventful. Neuromuscular block reversion: neostigmine-0,06mg/Kg and atropine-0,02mg/Kg. After an awake extubation, he developed inspiratory stridor and paradoxal chest movements. Dessaturation occurred even though aspiration of secretions in the oral cavity and face-mask administration of 100% oxygen with continuous positive airway pressure. The patient was reintubated. Suctioning of the tube revealed copious amounts of pinky sputum. Placed on mechanical ventilation and treated with PEEP, high FiO<sub>2</sub> and intravenous furosemide in the postanesthetic care unit (PACU). Gradual ventilator adjustments and FiO<sub>2</sub> reduction allowed successful extubation 22hours after and discharged to the surgical ward after 48hours.

**Conclusion:** NPPE develops when inspiring against a closed or obstructed airway generates a large negative intrathoracic pressure, creating a hydrostatic transpulmonary gradient that lastly originates fluid shift to interstitium and airspaces<sup>2</sup>. The clinical picture usually arises immediately after extubation but delayed manifestations have also been reported, justifying close postoperative monitoring for an extended time. Although uncommon (0.05 to 0.1%), and rapidly reversible with relatively simple management if recognized early, it can become a lifethreatening condition. The morbidity and mortality is as high as 40%<sup>3</sup>.

**References:** (1) Qual Saf Health Care 2005 14:e3; (2) Chest 2007; 131; 1742-1746; (3) The Internet Journal of Anesthesiology. 2007 Volume12 Nr1



## 96/Anaphylactic reaction to acetylcysteine after acetaminophen intravenous single shot overdose in a 11 month infant

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**Introduction:** Unintentional acetaminophen (APAP) overdose is the most common cause of acute liver failure, but in children severe hepatotoxicity is uncommon. This apparent protection is more seen in single shot overdose APAP administration. N-acetylcysteine (NAC) is the antidote of choice for APAP overdose and APAP induced liver failure especially for early presenters, but its use is not without risk. The reactions to the intravenous preparation result in similar clinical features of anaphylaxis but on the other hand, according to literature, APAP is protective against adverse effects of NAC.

**Case report:** Infant male, 11 months and 23 days, proposed for scheduled neurosurgery for correction of Lipomielomeningocele under general anesthesia. ASA I. No allergy history. Weight 10.5 kg and 74.5 cm tall.

ASA standard monitoring was performed associated with somatosensory and motor evoked potentials, central temperature, central venous pressure monitoring. The inhaled anesthesia induction with sevoflurane was replaced by intravenous maintenance by TCI with propofol (1%, Pk Kataria) and remifentanyl. The surgery proceeded without complications and with hemodynamic stability of the patient.

Approximately one hour until the end of the surgery was decided to proceed with the intravenous administration of 160 mg APAP (15 mg/kg) for postoperative analgesia. When converting this amount in ml to infuse in 20 min a calculation error occurred which led to program a infusion of 160 ml instead of 160 mg of APAP. The whole 100 ml package, corresponding to 1000mg was administered.

Immediate blood samples were collected for assay of plasma concentration of APAP and liver function evaluation. As the infant was taking too long to wake up and without corneal reflexes, despite anesthetic drugs residual doses, we started NAC therapy, 150 mg/kg intravenously, as soon as he got into the post anesthetic care unit. Two hours later he went to Intermediate Pediatric Care Unit, where he continued the infusion of NAC. It was when he developed a hypersensitivity reaction characterized by stridor and upper lip edema which was successfully treated with prednisolone and adrenaline 0.02 ug iv.

**Discussion:** The choice of starting NAC therapy may be a point of controversy especially because it was initiated before blood samples results arrival. Acute liver failure was not confirmed by changes in liver transaminases and initial level of APAP was within therapeutic levels (79.5 mg/mL). Nevertheless, the abnormal neurological examination could have been a lead of hepatotoxicity despite the apparent protection of children condition. The development of an anaphylactic reaction induced by NAC administration could have been emphasized by the low APAP serum level which is considered a risk factor by several studies.

One preventing measure to decrease the risk of acetaminophen overdose is reducing package sizes and maximum individual dose especially when children are concerned.





**21/Casual finding of meningocele during caudal epidural block. A case report.**

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We report the case of a four-year-old male, 20 kg, with no known allergies or relevant pathological antecedents, programmed for inguinal hernia repair and correction of hypospadiac foreskin.

After gas induction and insertion of LMA, we proceeded to perform a caudal epidural block. After locating (anatomically) the sacral hiatus we inserted a 22 gauge Abbocath needle, advancing it just a few millimeters before obtaining what seemed to be spinal fluid. We removed the needle and decided to verify the correct location of puncture with sonography, viewing an image compatible with meningocele. The suspicion was confirmed by a radiologist in the theatre, and the final diagnose was made by MRI scan.



### **30/Difficult airway management in Hurler syndrome.**

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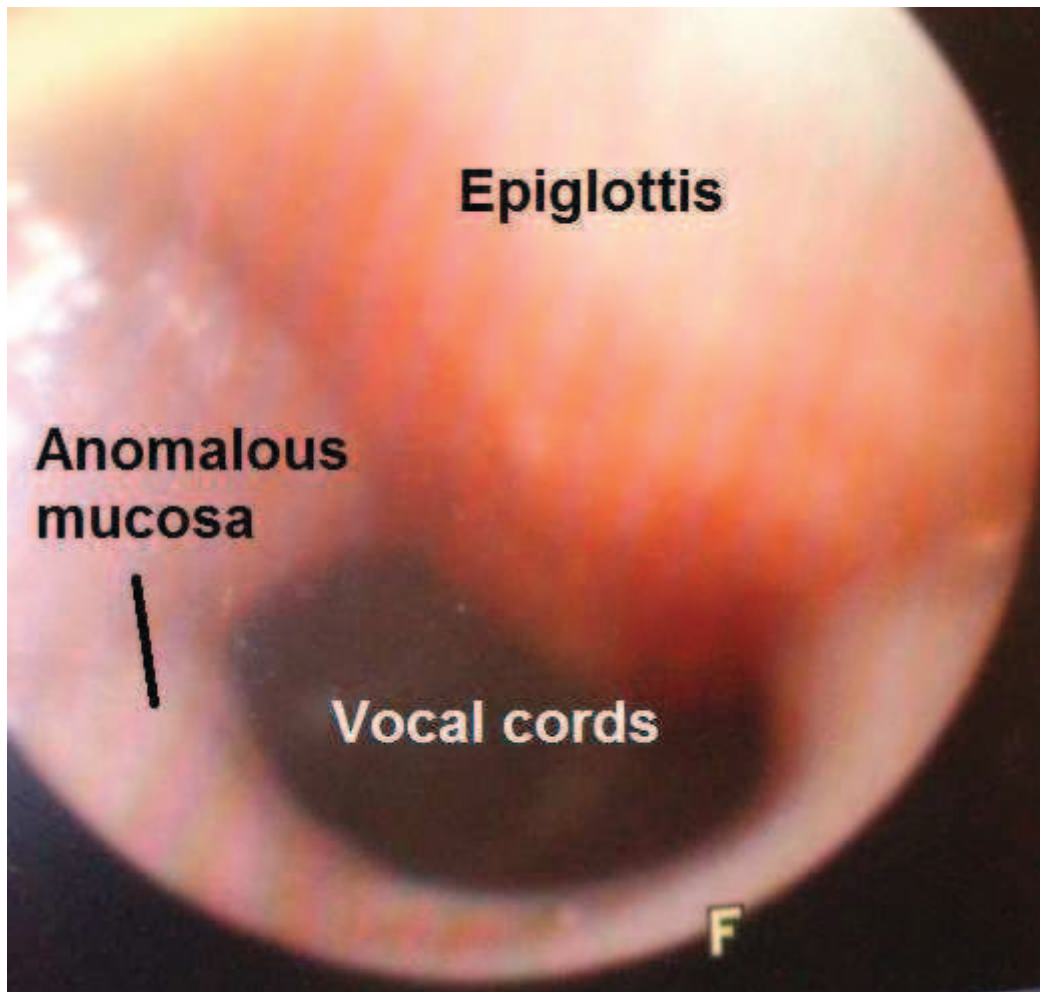
Hurler syndrome is a rare, inherited disease, in which a patient cannot break down long chains of sugar molecules (mucopolysaccharides). Anaesthetic management can be compromised in these patients by deformities and mucopolysaccharids deposits with a special attention to the management of the upper airway due to the high complication rate, close to 53% of all procedures.

Case report: 13 years old patient weighted 27 Kg affected from Hurler disease, scheduled for endoscopic surgery under general anesthesia. He also presented a limitation of the mouth opening, cervical spine instability (C5-C6), cardiomiopathy, mental retardation and a severe pulmonary restrictive disease. Difficult facial mask ventilation and tracheal intubation were reported in previous anaesthetic procedures. Basal pulse oximetry was 83%.

Facial mask preoxygenation was done during 3 minutes, and Sat O<sub>2</sub> raised upto 92%. Sedation with Fentanyl 1 µg/kg, Sevoforane 4% and topical lidocaine 2% was used to anesthetize the pharynx and to maintain spontaneous ventilation during nasal fiberoptic intubation. Direct laryngoscopy was ruled out at this point for clinical reasons.

After the application of topical anesthesia into both nostrils (lidocaine with 1/200.000 epinephrine), a pharyngeal tube (size 3,5) was placed through the left nostril with an oxygen flow of 3 l to maintain spontaneous ventilation and to avoid the upper airway collapse. SatO<sub>2</sub> was over 95% during the whole procedure.

After placement of the pharyngeal tube, a 3,7mm fibroscope was easily introduced through the right nostril to reach the pharynx. After that, identification of the glottis, or even the epiglottis was impossible. Respiratory air flow through an unidentified lookalike stenosis formed by epiglottis and affected mucosa helped us to locate the upper airway (image 1). The same affected mucosa was found in the oesophagus. Inside this anomalous structure, we recognized the vocal cords and other modified structures of the larynx. A size 5 reinforced tube was railroaded through the fibroscope and introduced into the trachea without problems. After the confirmation of the proper placement of the tracheal tube (ETCO<sub>2</sub> square wave form), general anesthesia was completed.



Nasal introduction of number 5 reinforced tube, was difficult not only by the malformation of both choanas, but also by the presence of mucopolysaccharid deposits in the conchaes that narrowed the lumen. Surgery was performed uneventually.

**Conclusion:** Mucopolysaccharidosis not only compromises spontaneous ventilation collapsing the upper airway, but it can also modify the laryngeal anatomy, making the recognition of the epiglottis or even the whole glottis impossible and tracheal intubation a real challenge.



### 37/CASE STUDY: REMOVAL OF SUBGLOTTIC CYSTS IN A 14MONTH-OLD CHILD UNDER SPONTANEOUS VENTILATION

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**Introduction** Subglottic cysts are main causes of stridor in infants. They are often associated with endotracheal intubation along with prolonged periods of mechanical ventilation. Treatment of choice is surgical excision with marsupialisation.

**Case report** A 14 month old girl, 10 kg of weight, was admitted to the ENT Department for excision of two subglottic cysts. According to her history, she was prematurely born at 23 weeks of gestation and weighted 1 kg. She was intubated and mechanically ventilated for two weeks. After her discharge, she was repeatedly admitted to the Pediatric Department for severe cough, mainly after crying, and wheezing during inhalation and exhalation. Diagnostic bronchoscopy revealed two subglottic cysts right below the vocal cords and surgery was scheduled. After the induction of anesthesia with sevoflurane, fentanyl and rocuronium, the child was intubated with an ETT 2.0 mm. The simultaneous presence of the ETT and the bronchoscope was impossible, due to the narrow entrance of the larynx. An alternative ventilation method was sought. As soon as the child regained spontaneous ventilation, and under the continuous inhalation of sevoflurane (2-3%) and oxygen, an ETT 3.5mm was inserted through the nostril and advanced down to the entrance of the trachea without entering the glottis. Having the place to work, the ENT surgeons successfully excised the cysts. Patient's vital signs were normal. Anesthesia and recovery were uneventful.

**Discussion** Removal of subglottic cysts is a delicate task for the anaesthesiologist, due to sharing of the airway with the surgeons. Ventilation is usually achieved through ETT or a suction catheter advanced down to the trachea. Use of a bronchoscope through an LMA or the simultaneous insertion of a 14F suction catheter and a bronchoscope in the trachea have also been described. The most interventional method is tracheostomy, a procedure associated with many complications in that young age. In our case, the insertion of the endotracheal tube through the nostril and its advancement just above the glottis and not beyond it, along with spontaneous ventilation with sevoflurane and oxygen provided unconsciousness and adequate oxygenation to the child, and, additionally, optimal surgical conditions, especially under the circumstances of subglottic cysts being so close to the glottis.

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## 92/DIFFICULT INTUBATION IN PAEDIATRIC PATIENTS WITH CLEFT LIP AND PALATE

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**Introduction:** Cleft lip and palate are common congenital deformities, which require surgical repairs during infancy<sup>1</sup>. Besides the difficulty in airway management caused by inherent characteristics of children's airway, cleft lip and palate and their related deformities may further increase difficulty in intubation<sup>1</sup>. The aim of this study was to evaluate the relationship of number of intubation attempts (NIA) with age, other facial dysmorphia, cleft degree and cleft laterality.

**Methods:** Retrospective analysis of 108 pediatric patients submitted to cleft lip surgery repair with or without cleft palate repair, from January 2006 to March 2010. Demographic data, cleft degree, facial dysmorphia, NIA and additional information related to intubation were collected from PICIS® (anesthesia software) and clinical records. Fifteen patients excluded for incomplete data. Ninety-three patients were included. Relationships between age groups (< 6 months, <sup>3</sup> 6 months and < 1 year, <sup>3</sup> 1 year), facial dysmorphia (micrognathia, Pierre-Robin, Treacher-Collins and DiGeorge Syndromes), cleft degree (cleft lip, cleft palate with or without lip), cleft laterality and NIA mean were evaluated. Statistical analysis was performed with MedCalc® using Anova Test.

**Results and discussion:** Results presented in Table 1. There was a significant increase of NIA in patients with facial dysmorphia (p=0,028) and a trend toward higher NIA with cleft palate (p=0,08). NIA doesn't seem to be influenced by age (p=0,22) or cleft laterality (p=0,23).

Table 1- Relationships between facial dysmorphias, age groups, cleft degree and laterality with NIA mean.

		n (%)	n	NIA mean	p value
Facial dysmorphia	Yes	7 (8)	93	2,00	0,028
	No	86 (92)		1,46	
Age groups	< 6 months	36 (39)	93	1,61	0,22
	≥ 6 months and < 1 year	29 (31)		1,59	
	≥ 1 year	28 (30)		1,28	
Cleft degree	Lip	21 (23)	93	1,24	0,08
	Palate (with or without lip)	72 (77)		1,58	
Cleft laterality	Right	12 (13)	92*	1,17	0,23
	Left	29 (31)		1,66	
	Bilateral	45 (49)		1,56	
	Median	6 (7)		1,17	

\*One patient excluded for lack of information regarding cleft laterality.

**References:** 1) Xue FS et al; The clinical observation of difficult laryngoscopy and difficult intubation in infants with cleft lip and palate; Pediatric Anesthesia 2006; 16 (3): 283-289.



## 81/ "POST-OP GRAYISH LIP COLOUR IN BURNED INFANT - CASE REPORT"

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**Introduction:** Silver based compounds are used as antimicrobial agents in burns treatment. Acticoat® (Smith&Nephew) plates, with silver nanocrystals are a recent treatment that is becoming more popular. There are few reports of argyria-like syndromes after its use.

**Clinical case:** A 10 months, female, infant, ASA II. Proposed for surgical debridement of 2<sup>nd</sup> degree burns in 21% of total body area. A general inhalatory anaesthesia, with Sevoflurane, has been performed. Per-operative analgesia with fentanyl and pos-operative with paracetamol iv and morphine iv. Surgeons washed and made the debridement with Versajet® (a hydro surgical debridement system) and applied a dressing with Acticoat® plates. The total procedure lasted 2h30m. In the Post-Anaesthesia Care Unit the infant presented a bluish-gray discoloration on the lips and face. She was hemodynamically stable, spontaneously breathing room air with an SpO<sub>2</sub> 96%-99%, with no signs of respiratory distress and normothermic. Suspecting of silver intoxication we dosed silver in blood and a 30x superior to normal value was found (129µg/L, reference: 0,69-4,5µg/L[1]). Liver and renal functions were normal. After this episode the patient has been submitted to several debridement surgeries and dressings with Acticoat® plates but the use of the Versajet® has been avoided. Never again the bluish-gray discoloration occurred. Liver and renal functions remain normal all the time.

**Results and Discussion:** The use of Acticoat® on burn treatment causes silver salts absorption and consequent elevation of plasmatic levels, with hepatotoxicity and argyria-like symptoms[2] described, justifying the occurrence of bluish-gray cutaneous discoloration that can, easily, be confounded with cyanosis. The anaesthesiologist must consider this possibility after excluding the hypothesis of respiratory distress and hypothermia. In this particular case, the burn extension[3], associated at the intensive use of the Versajet®, are factors that contributed to a bigger systemic absorption of silver.

**References:** [1] J-P Goullé, Forensic Science International, 2005; [2] J Trauma 2006; 60(3):648-52; [3] J Burn Care Res 2009; 30(2):341-8.



**Session Friday**



### **32/AN AUDIT OF THE ACUTE MANAGEMENT OF SICKLE PAIN IN CHILDREN IN THE FIRST 24 HOURS OF PRESENTATION.**

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**Introduction.** The management of acute sickle pain in children can be challenging and where possible, an early non intravenous opioid analgesia may be sought. Our institution has devised a rapid and aggressive analgesic protocol (1). Patients under one month of age or who have with severe chest syndrome, girdle pain and vomiting are excluded from the protocol. Within five minutes of assessment in the emergency department, and following simple analgesia, patients are administered a single dose of intranasal diamorphine (0.1mg/kg) or fentanyl lozenges, then oromorph (400mcg/kg). After, one hour they receive a 2<sup>nd</sup> dose of oromorph if appropriate and after a further 2 hours may receive further oromorph or intravenous morphine patient/nurse controlled device (PCA) if pain is unacceptable. We aim to look at the relationship between those patients who ultimately receive PCA and the compliance with our early aggressive protocol.

**Methods.** A retrospective audit of the immediate analgesic management of patients in sickle crisis, determining the demographic data, protocol compliance and initial analgesic requirements over the first 24 hours. We aim to identify which children require intravenous morphine. We will use logistical regression, using PCA morphine consumption as an end point and risk factors considered such as timing of oromorph and the use of intranasal diamorphine

**Results.** Our preliminary results from 8 patients, aged between 2-15, all of which were HBSS with crisis which either included joint, chest or hepatic involvement precipitated by either infection, trauma or unknown. The average time between assessment and administration of the first analgesia in the A + E dept ranged from 5-41 minutes. All had simple ibuprofen and paracetamol. Only 2/8 received intranasal diamorphine and 2/8 received fentanyl lozenges. All received oromorph and 5/8 received within the first hour of attendance. Three patients were placed on morphine PCAs and two went on to receive slow release morphine (MST).

**Discussion.** A variety of analgesic strategies have been demonstrated amongst these initial patients. It must be appreciated that experiences of pain and patterns of hospital admissions may be influenced by other factors as well as disease severity. Indeed, individuals who manage their pain at home demonstrate different attitudes and strategies towards hospital care from those who are frequently admitted.2). We need to collect further data and aim to present 30 patients. We can then explore the relationship between protocol compliance and PCA usage. Apparent poor compliance to the protocol may prompt the need for better departmental communication and education.

**References :** 1) Paediatric acute sickle pain protocol. St Barts and Royal London Hospital  
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### **53/DEXKETOPROFEN, AS A POSSIBLE DRUG FOR THE SAFE POSTOPERATIVE ANALGESIA IN PEDIATRIC UROLOGY.**

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**Introduction.** In search of safe and effective postoperative analgesia we used new NSAID – Dexketoprofen. According to the previous experience racemic ketoprofen using in child's age and information about safe and successful application of dexketoprofen for adults we compared racemic ketoprofen and dexketoprofen for the postoperative analgesia. Results were presented on previous congress. They showed possibility of using dexketoprofen for children and better tolerability compared to racemic ketoprofen. The purpose of our work was a further study of clinical efficiency and safety of dexketoprofen for the postoperative analgesia in pediatric urology.

**Patients and Methods.** 482 healthy boys (ASA I), age  $7,22 \pm 4,62$  [3-15], (after permission of ethics committee of hospital and informed consent of parents), middle traumatic and durations operations were performed (circumcisio, orhypexia, hydrocele, varicocele repair) with standardized anaesthesia: TIVA propofol 3 mg/kg, fentanyl 5mg/kg, atracurium 0.4 mg/kg; maintenance – infusion propofol 10mg/kg/h, brief supporting – LMA.

The postoperative analgesia – IV bolus of dexketoprofen 1 mg/kg at induction in anaesthesia. Patients received repeated doses of drug in postoperative period (up to 24 h) depending on a necessity (on achievement of 4 points on the VAS). Level of pain (was fixed time to achieve 4 points on the VAS), multipleness of analgesic injection, complications and side effects were registered (PONV, breath or hemodynamic depression, gastrointestinal bleeding, kidney or cardiac complications, hemostasis changes).

**Results:** Median pain scores during 24 hours reached 3 points (from 2 to 5) on the VAS. Mean time ( $\pm$ SD) of reaching 4 VAS points was  $336,35 \pm 62,14$  min. The multipleness of injections was  $0,8 \pm 0,53$ . PONV frequency was 12,1%. Additional use of rescue analgesics (opiates) was not required. No renal, gastrointestinal or cardiac adverse events met.

**Conclusion:** Using of dexketoprofen at child's urology during short time after middle traumatic operations allows to get the effective and safe postoperative analgesia and deserves a further study.

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## **70/A COMPARISON OF ANALGESIC REQUIREMENTS IN PAEDIATRIC DAY CASE LAPAROSCOPIC AND OPEN SURGERIES.**

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**Introduction.** Main determinants of the success of paediatric day case surgery include appropriate patient selection, attention to postoperative complications and adequate analgesic cover. Inadequate analgesia limits patient recovery and may result in longer hospital stay. It has also been associated with increased postoperative nausea and vomiting. Therefore appropriate assessment and management of analgesic requirements in paediatric day case surgery assumes an even more important role<sup>1</sup>. Laparoscopic surgery has revolutionised postoperative care in day case surgery due to the smaller and more cosmetic incision, reduced blood loss and shorter post-operative stay which cuts down on hospital costs. However the general concept regarding analgesic requirements in laparoscopic procedures when compared with open surgeries is still disputed. We conducted a survey to assess the analgesic requirements and efficiency of caudal blocks in open and laparoscopic day case paediatric surgical cases.

**Methods.** A retrospective study was performed on all day case laparoscopic surgeries over a period of 12 months in our hospital. A standard questionnaire was filled using information from the case notes of 40 patients. The results were then compared with open day case paediatric surgeries over a period of one year (36 patients).

**Results and discussion.** In the laparoscopic group 67% (27) patients were given caudal, 37%(10) of the caudal patients were given intraoperative analgesia and 40%(11) required postoperative analgesia. Hence the block was efficient in 60% of the patients.

In the open surgery group all patients received preoperative analgesia, 77% (28) of them were given caudal blocks. 35% (10) of those who were given a block needed analgesia intraoperatively. 21% (6) patients required further analgesia in recovery. Therefore the block was efficient in 79% of the patients.

The results were complicated by the use of analgesics intraoperatively especially in the laparoscopic group where they were administered either because the caudal was considered to have failed or due to its anticipated inadequacy in laparoscopic procedures. Hence our chosen end point for failure of caudals was the use of analgesia postoperatively.

In our study the efficiency of caudal blocks was better in providing adequate analgesia for open procedures as compared to laparoscopic surgical day case procedures. Also it was identified that laparoscopic procedures require more pain relief compared to open procedures despite the smaller incision and less invasive surgery.

### **References**

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## **74/Chloral hydrate - a safe and effective option for children sedation scheduled for CT and MR**

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**Introduction:** Chloral hydrate (CH) is a hypnotic drug that induces sleep when administered in doses of 50-100 mg/kg, with no respiratory or hemodynamic adverse events in most children. Therefore, it can be a good option for sedating children scheduled for imaging exams that require immobilization.

**Objectives:** analyze the efficiency and adverse effects caused by oral CH, in children scheduled for MR and TC.

**Methods:** retrospective analysis of 948 clinical charts of children up to 13 kg (under 4 years), selected using the revised American Academy of Pediatrics (AAP) monitoring and management guidelines for pediatric sedation, scheduled for CT or MR during the period of 2006-2009.

**Results:** 948 children up to 13 kg, realized CT or MR. 708 (75%) were sedated with CH and 240 (25%) were anesthetized with sevoflurane. Within the group of children sedated with CH, 469(66%) did CT with doses of 50mg/kg, and 239 (34%) did MR with doses of 80-100 mg/kg. The success rate for CH was: 99.95% for CT and 97% for MR. The average time for sedation full effect was 30 minutes while the average duration was 50-90 minutes (depending on the dosage). Mild hypoxia (90-95%), resolved spontaneously without any therapeutic intervention, was registered in 7% of the cases; 0.001% developed moderate hypoxia (85-89%), and an additional 0.001% suffered from severe hypoxia (<85%); For the most severe cases, 0.003% required prolonged sedation and consequently prolonged hospitalization.

**Conclusions:** CH is an efficient hypnotic drug with low incidence of cardio respiratory complications. The high rate of success achieved was made possible due to its use in children of weight below 13 kg, and submitted to a comprehensive medical screening.



## **2/The effects of 18-hour propofol infusion on hepatic and pancreatic function in children undergoing prolonged surgical operation and receiving analgesics**

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**BACKGROUND:** In this study, we investigated the effects of propofol infusion on hepatic and pancreatic enzymes with baseline values in children undergoing surgical operation who were receiving analgesic ketorolac, fentanyl, tramadol.

**METHODS:** In this prospective clinical study, we measured the serum aspartate aminotransferase (AST), alanine aminotransferase (ALT), gamma-glutamyl transpeptidase (GGT), alkaline phosphatase (ALP), pancreatic amylase and triglyceride levels of 30 children. All children received propofol anesthesia. Peroral 30 mg ketorolac and opioid analgesics were started in patients who were not receiving analgesics. Serum AST, ALT, GGT, ALP, pancreatic amylase and triglyceride levels were studied on admission to the hospital, 1 day before surgery, and on postoperative Days 1 and 3. Arterial blood gas samplings were taken after tracheal intubation, during the operation, just after extubation, and 6 and 12 h after extubation.

**RESULTS:** Serum AST, ALT, GGT, ALP, pancreatic amylase and triglyceride levels were increased significantly in the postoperative period compared with baseline with a peak value on postoperative Day 1 and returned to normal values within a week. Base excess levels after extubation were significantly decreased compared with baseline. They were in the normal range, however, and returned to baseline values by 6 h after surgery. There were no clinical signs of hepatitis or pancreatitis.

**CONCLUSIONS:** Despite the slightly increased pancreatic and hepatic enzyme levels during the postoperative period, anesthesia maintenance with propofol in children had no significant clinical effect on the acid-base status or pancreas or liver enzymes.



### 3/Use of sucrose analgesia in newborns with anorectal abnormality undergoing painful medical procedures

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**Background:** Our objectives were to evaluate the effectiveness and safety of sucrose in newborns undergoing various medical procedures.

**Methods:** We performed a double-blind, randomized controlled trial. We included 91 newborns ( $28,5 \pm 1,4$  weeks gestation). Each newborn received 2 ml of a 24%-sucrose or placebo solution before all procedures. We used the Premature Infant Pain Profile to assess pain during intramuscular injection, venipuncture for the newborn screening test and the first 3 heel lances for glucose monitoring. Scores ranged from from 0 (no pain) to 18 (maximum pain).

**Results:** We included 23 newborns. The overall mean pain score was lower among newborns who received sucrose than among those who received a placebo (mean difference [MD] -1.46, 94% confidence interval [CI] -1.87 to -0.61). We found that pain scores during intramuscular injection did not differ significantly between the sucrose and placebo groups for newborns (newborns of 1 group: MD -1.32, 97% CI -2.31 to 0.2; newborns of 2 group: MD -1.1, 90% CI -2.42 to 0.5). During venipuncture, newborns who received sucrose had lower pain scores compared with those who received a placebo (newborns of 1 group: MD -3.54, 96% CI -4.2 to -1.91; newborns of 2 group: MD -2.12, 95% CI -3.6 to -1.1).

**Conclusion:** We found a modest reduction of pain in newborns when sucrose was used for all medical procedures performed in the first 7 days after birth. However, when each procedure was analyzed separately, we found that the effectiveness of sucrose was limited to venipuncture for the newborn screening test.



**43/Systemic postoperative pain management following minimally invasive pectus excavatum repair in children and adolescents: A retrospective comparison of intravenous patient-controlled analgesia and continuous infusion with morphine**

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**Purpose:** Optimal postoperative pain management following minimally invasive surgical repair of pectus excavatum is not established. We compared efficacy and adverse effects in patients treated with patient-controlled analgesia (PCA) with those treated with continuous infusion (CI) with morphine in addition to nonsteroidal anti-inflammatory drugs.

**Methods:** 33 patient records were examined retrospectively: 21 given PCA and 12-CI with morphine. Main outcome variables were used doses of morphine, pain scores every 3 hours and adverse effects.

**Results:** median (range) used morphine dose was 0,58 (0,21-1,12) and 0,52 (0,34-0,84) mg/kg on the day 1 and 0,3 (0,02-0,6) and 0,33 (0,09-0,53) on the day 2 in PCA and CI-groups, respectively ( $p>0,05$ ). Pain scores were within moderate and low levels during 42 hours after surgery and did not differ between the groups. Median (range) oxygen saturation was 96,5 (93-100) and 97 (94-100) in PCA and CI-group respectively ( $p>0,05$ ). Additional oxygen therapy was required in 14,3% in PCA-group and 25% in CI-group ( $p>0,05$ ). The incidence of pulmonary adverse effects was rare and did not differ between the groups.

**Conclusion:** both methods of systemic analgesia in addition to non-opioid analgesics were equally effective and resulted in a low incidence of pulmonary adverse effects.



**66/Sickness in children treated with intravenous morphine for postoperative pain: compare age and male/female sex.**

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**Introduction:** The aim of this study is to compare sickness in patients treated with iv morphine for postoperative pain and to analyse the possible relation between age or sex (male/female) and sickness.

**Material and methods:** Retrospective study of patients treated with intravenous morphine for postoperative pain in Children's Hospital Doce de Octubre de Madrid from January 2005 to December 2009. A total of 1630 patients whom received iv morphine PCA/NCA system in analgesic protocols, which depend on the surgery suffered and the age. Patients were divided in three groups; Group 1 (younger than 5 years), Group 2 (from 5 years to 8 years old), Group 3 (older than 8 years). Sickness during the first day postoperative was noted in; Group A (no sickness), Group B (only one sickness), Group C (several sicknesses that needed pharmacologic treatment). The Pearson's Chi-square Test has been used for evaluating the statistical significance.

**Results:** Significant differences have been found with respect to sickness and age. Patients older than 8 years suffered several sicknesses that needed treatment in first postoperative day. The apparition of sickness in Group 3 (children older than 9 years) has no significant differences between male and female patients. See table 1.

	Group A	Group B	Group C	Total	p<0.001
Age: group 1	661	63	20	744	
Age: group 2	181	43	28	252	
Age: group 3	468	107	59	634	
<b>Total</b>	1310	213	107	1630	

**Table 1**

	Group A	Group B	Group C	Total	p<0.261
Female	189	100	0	289	p<0.1897
Male	281	62	2	345	
<b>Total</b>	470	162	2	634	

**Table 2**

**Discussion:** It is necessary to design protocols to prevent sickness only in one class of patients (older than 8 years). In this way the cost and the efficacy of these pharmacologic treatments are controlled. It is important to realise different studies to find relation between sickness and other variables (morphine dose, pain control, surgery...), in order to control them.



## 82/ SEDATIVE PRE-MEDICATION IN PRACTICE: A PROSPECTIVE AUDIT

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**INTRODUCTION:** Use of sedative pre-medication can reduce anxiety in children presenting for surgery but its utility is limited by optimal timing of administration prior to induction, and potential unwanted effects. At our tertiary referral hospital pre-medication is not used routinely. Instead the attending anaesthetists chooses to selectively pre-medicate children who may benefit from sedative pre-medication. We audited the current use of premedication to evaluate its effectiveness and identify areas of improvement in timing of administration prior to induction.

**Method:** All patients who were administered a sedative premedication over a 5 week period were included. Patient age, weight, and type and dose of premed were recorded. We collected detailed information on the precise timings from the anaesthetists request for administration of the pre-med, the time administered, time taken for transport into theatre and to induction of anaesthesia. Co-operation with induction, sedation scores and anxiety level were assessed. Parents routinely accompany children at induction of anaesthesia.

**Results:** Eighty-five children who presented for surgery in the 5 week study period were prescribed a sedative pre-medication (midazolam 0.5-0.75mg/kg 87% and temazepam 0.25-0.5mg/kg 13%). This was less than 5% of our patients presenting for surgery. The mean age was 7.3 years (standard deviation 3.7) Of all pre-medicated children, 70.5% had satisfactory behaviour at induction. Of the 25 children who had unsatisfactory behaviour, only 15 had accepted the pre-med whilst the remainder refused, spat it up or vomited. Three of these children did not proceed to scheduled surgery that day due to patient refusal, on-going vomiting or excessive anxiety. The average time taken for nurses to administer the premed by nursing staff was 15 minutes, (standard deviation 9 minutes). The mean time between pre-med administration and induction of anaesthesia was 38 minutes, standard deviation 13 minutes. There were no statistically significant differences in the time from administration to induction between the group which were successfully pre-medicated and those that weren't,  $p=0.11$ . Four children who were pre-medicated exhibited adverse behaviours post-operatively: three were aggressive and agitated, one was excessively somnolent.

**Discussion:** Sedative pre-medication was effective in ensuring co-operation with induction in 70% of patients, when used selectively. Although there were not statistically significant differences administration timing, the audit suggests some areas of improvement in the timing of pre-medication, which may result in improved effectiveness. Adverse effects were uncommon and occurred with frequency consistent with results from clinical trials.

**Conclusion:** Use of pre-medication is uncommon at our hospital, although when used it is mostly produces the desired effect. We will review current practise to improve optimal timing for administration of pre-meds, and examine other factors which may enhance its effectiveness.



## 86/ INTRATHECAL MORPHINE 3 $\mu\text{G.KG}^{-1}$ VS 5 $\mu\text{G.KG}^{-1}$ IN PAEDIATRIC SURGERY

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**BACKGROUND:** The reported use of intrathecal morphine in the pediatric surgical population has been limited to spine (*Anesth Analg* 2004; 98:956-65) and cardiac (*Acta Anaesthesiol Scand* 2004; 48:875-82) surgery. The doses in these studies ranged from 5 to 30  $\mu\text{g.kg}^{-1}$ . We propose to compare the postoperative analgesic effect of two doses of intrathecal morphine: 3 versus 5  $\mu\text{g.kg}^{-1}$  in sus-mesocolic and thoracic surgery in children.

**METHODS:** After ethics committee approval and parental informed consent, we conducted a prospective randomized double blinded study including ASA I-II children, aged between 1 to 9 years, undergoing sus-mesocolic or thoracic surgery. Patients were randomly allocated to receive either 3  $\mu\text{g.kg}^{-1}$  (GA) or 5  $\mu\text{g.kg}^{-1}$  (GB) intrathecal morphine, immediately after induction of standardized general anesthesia. The injected volume was 0.1  $\text{ml.kg}^{-1}$  for all the patients (Morphine: GA (30  $\mu\text{g.ml}^{-1}$ ) and GB (50  $\mu\text{g.ml}^{-1}$ )). Sevoflurane, remifentanyl and cisatracurium were used for maintenance of anaesthesia. Children received paracetamol 15  $\text{mg.kg}^{-1}$  at the end of surgery. Postoperative pain was assessed at regular intervals during the first 24 hours using CHEOPS score. Analgesia was supplemented when pain score was  $\geq 7$  (nalbuphine 0.2  $\text{mg.kg}^{-1}$ ). Time to first requirement, the total doses of analgesic given and morphine adverse effects were noted. Chi-square and U test of Mann Whitney were used in statistical analysis;  $p < 0.05$  was considered significant.

**RESULTS:** Twenty five children were included with (GA= 14; GB= 11). There were no differences between groups regarding demographic characteristics, kind and duration of surgery. Mean CHEOPS scores and total doses of analgesic given were similar in the two groups. Times to first requirement and number of patients with Ramsay scores  $> 2$  during 24 hours were also similar. No patient in both groups had developed postoperative respiratory depression. The incidence of nausea-vomiting, pruritis and urinary retention were similar in both groups.

**CONCLUSION:** Intrathecal morphine 3  $\mu\text{g.kg}^{-1}$  compared to 5  $\mu\text{g.kg}^{-1}$  provided equivalent postoperative analgesia in thoracic and sus-mesocolic surgery in children with similar adverse effects.



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**Session Saturday morning.**



### 31/Comparison of Laryngeal Mask Airway, Cobra Perilaryngeal Airway and FaceMask for Airway Management in Children

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**Purpose :** Our study aimed to compare the effects of laryngeal mask airway (LMA), face mask and Cobra perilaryngeal airway (Cobra PLA) in airway management of spontaneously ventilated pediatric patients undergoing elective inguinal surgery.

**Materials and methods :** The ethics committee and parental consent, ASA I-II patients undergoing elective inguinal surgery, 90 cases between the ages of 1-14 enrolled in the study. Patients were randomly divided into 3 groups. Group I laryngeal mask airway, Group II Cobra perilaryngeal airway, group III was determined as the face mask. Get together with parents to the operating room anesthesia to patients, using the appropriate face mask, the sevoflurane concentration of 6-8%, 50% nitrous oxide and oxygen with a mixture of 50% was achieved. Intravenously to patients with ageappropriate intravenous cannulation after providing adequate depth of anesthesia, Group 1 and 2, according to the weight of children of supraglottic airway devices were inserted. It was recorded that the duration and number of insertion provided by the anesthesiologist. Hemodynamic parameters of patients, systolic blood pressure, diastolic blood pressure, heart rate and peripheral arterial oxygen saturation were recorded preoperatively, after induction, after the instrumentation, peroperative 5-10-15 and 30 minutes. Also, the inhaled sevoflurane concentration, end-tidal sevoflurane concentration, tidal volume, plateau pressure, peak inspiratory pressure, positive end expiratory pressure and end tidal carbon dioxide levels were recorded after induction, the airway attempts later, peroperative 5-10-15 and 30 minutes. No intraoperative or postoperative complications were observed in all cases,

**Results:** Hemodynamic parameters in all measurements in terms of statistical difference ( $p > 0.05$ ). End tidal sevoflurane concentration was found to be similar in all groups ( $p > 0.05$ ). To ensure safe airway time spent that recorded in Group 2 less than the other groups were statistically significant ( $p < 0.05$ ). Instrumentation on the first try success was 63.3% in Group 1 and Group 2, 83.3% in determining the statistical difference ( $p > 0.05$ ). Tidal volume measurements were similar between the groups ( $p > 0.05$ ). Positive end expiratory pressure, plateau and peak inspiration pressure were statistically in Group 2 lower than Group 1 and Group 3 ( $p < 0.05$ ). ETCO<sub>2</sub> values were higher in group 2 than the other groups ( $p < 0.05$ ). Complications were evaluated, no significant differences between the three groups ( $p > 0.05$ ).

**Conclusion:** As a result of airway safety and possible complications with respect to LMA and Cobra can be an alternative to face mask. Cobra PLA would provide lower airway pressure than the LMA and quick and easy way by placing.



## 94/INFRAORBITAL NERVE BLOCK VERSUS INTRAVENOUS ANALGESIA FOR POSTOPERATIVE PAIN CONTROL AFTER CLEFT LIP REPAIR IN PAEDIATRIC PATIENTS

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**Introduction:** Cleft lip repair is commonly performed in infants around three months of age<sup>1</sup>. It is imperative that children are comfortable so that the closure of the suture lines can be maintained<sup>1</sup>. Regional analgesia is often combined with general anesthesia to provide rapid recovery after surgery with earlier discharge and potential reduction of opioid side effects<sup>1</sup>. Infraorbital nerve block (INB) has been used in paediatric patients undergoing cleft lip repair<sup>1</sup>. The aim of this study was to compare efficacy of INB with multimodal intravenous analgesia (MIVA) in children undergoing cleft lip repair.

**Methods:** Retrospective analysis of 108 paediatric patients scheduled to cleft lip repair surgery, cleft palate surgery or both, from January 2006 to March 2010. Clinical information was collected from PICIS® (anesthesia software) and medical records. Demographic and surgical data, intraoperative analgesia (INB, MIVA, INB+MIVA), rescue analgesia in the Postanesthetic Care Unit (PACU) and in Paediatric Surgery Ward (PSW), time to first feeding and opioid side effects were recorded. Selection of the patients submitted to lip surgery (n=57) and division into groups of analgesia: INB (n=14), MIVA (n=11) and INB+MIVA (n=32). Exclusion of those submitted to INB+MIVA. Statistical analysis performed with MedCalc®, using Anova and Chi-Square Tests.

**Results and discussion:** Results presented in Table 1. The INB can be effectively used for pain control in paediatric patients undergoing cleft lip repair. The INB group did not differ significantly from the MIVA group concerning rescue analgesia in postoperative period (PACU and PSW) and time to first feeding, as reported in previous studies. One of the limitations of our study is the small sample size. We did not find any medical records referring to the presence of opioid adverse effects in the postoperative period.

Table 1: Type of analgesia and their relationships with sex, PACU and PSW rescue analgesia and time to first feeding (m-mean; M-Male; F-Female; Y-Yes; N-No).

Analgesia type	Sex			PACU rescue analgesia			PSW rescue analgesia			Time to first feeding (hours)	
	M	F	p	Y	N	p	Y	N	p	m	p
INB (n=14)	8	6	0,03	3	11	0.31	0	14	0.35	5.3	0.42
IV (n=11)	1	10		0	11		2	9		7.5	

**References:** 1) Simion C et al; Postoperative pain control for primary cleft lip repair in infants : is there an advantage in performing peripheral nerve blocks?; Pediatric Anesthesia 2008; 18: 1060-1065.



### 87/ Effect of sub hypnotic doses of propofol compared to ketamine on emergence agitation in children after sevoflurane anaesthesia

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**INTRODUCTION:** Preschool children seem to be more exposed to the emergence agitation after sevoflurane anaesthesia (*Anaesthesiology* 1997; 87:1298-300). Different drugs have been used to decrease its occurrence with variable efficacy. The aim of our study was to compare the preventive effects of the propofol to ketamine in the emergence agitation's appearance in children undergoing elective parietal surgery.

**MATERIAL and METHODS:** The study protocol was approved by the local committee of ethics and all parents gave written informed consent before enrolment. We performed a prospective randomized study including children aged between 2 and 6 years, ASA status 1-2 and scheduled for elective parietal surgery. Anaesthesia was induced with sevoflurane 6% and a regional block was performed using bupivacaine 0.25%. Anaesthesia was maintained with sevoflurane 2 % and O<sub>2</sub>+N<sub>2</sub>O at 0.5. Children were allowed to regain spontaneous ventilation. Patients were randomly allocated to receive at the end of surgery propofol 1mg.kg<sup>-1</sup> (GP), ketamine 0.25mg.kg<sup>-1</sup> (GK) or serum saline (GS). At recovery room, Paediatric Anaesthesia Emergence Delirium scale (PAEDs), Ramsay scale and CHEOPS were recorded every 5 minutes during 30 minutes. The duration of sevoflurane inhalation and the time to eye opening were also collected. We used Anova table to compare quantitative variables and Chi square test and exact test of Fisher for qualitative variables. Differences were considered significant at p = 0.05.

**RESULTS:** One hundred fourteen (114) patients were enrolled. Five children were excluded because of failure of parietal block. Demographic data and the duration of sevoflurane inhalation were similar in 3 groups. Incidence of emergence agitation as well as time to eye opening were not significantly different between the three groups. The incidence of agitation was lower in propofol group.

**Table 1: Comparison between the three groups regarding recovery, incidence of post operative agitation and sedation**

	GS (n=37)	GP (n=35)	GK (n=37)	p
Agitation (PAEDS ≥ 10/20)	4 (10.8%)	2 (5.7%)	6 (16.2%)	ns
PAEDS means	5.9+/- 2.8	4.8+/-2.6	6.3+/-2.6	0.049
Sedation (Ramsay >2)	4 (10.8%)	3 (8.6%)	8 (21.6%)	ns
Time to eye opening (min)	11.4+/-5.6	12+/-5.5	11.2+/-5.3	ns

**CONCLUSION:** In our study, sub hypnotic doses of propofol or ketamine didn't reduce the incidence of emergence agitation after sevoflurane anesthesia. However, propofol may reduce the intensity of post operative agitation.



### 84/ Predictive factors of deep venous thrombosis in children with acute hematogenous osteomyelitis

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**Background:** The aim of our study was to determine predictive factors of deep venous thrombosis (DVT) in children with acute hematogenous osteomyelitis (AHO).

**Material and methods:** After ethics committee approval and parental informed consent, We conducted a prospective study including all children admitted between April 2007 and December 2009 with the diagnosis of AHO. Each child had on admission an inflammatory balance (C-Reactive Protein (CRP) and Erythrocyte sedimentation rate (ESR)) and a bacteriological investigation (blood culture, pus and tissue biopsies in operated patients). A Doppler ultrasound was systematically performed on admission of patients and repeated if the child developed local inflammatory signs during the hospitalization. We monitored the evolution of fever and the occurrence of systemic complications. Patient's characteristics were compared with Student's t (quantitative variables) and Chi-square (qualitative variables) tests. Multivariate logistic regression analysis was used to determine the independent predictive factors. A p value < 0.05 was considered to be statistically significant.

**Results:** The study included 70 children, average age was 7 years. A germ was found in 45 cases (64.5%). *Staphylococcus aureus* (SA) was isolated in 39 patients (6 were methicillin resistant). Seven children developed deep vein thrombosis (10%).

**Table I: Predictive factors of deep venous thrombosis (univariate analysis)**

	DVT (n=7)	No DVT (n=63)	p
ESR (mm)	84	48	0.03
MRSA (N)	3	3	0.04
Positive Blood culture (N)	6	23	0.02
Pulmonary staphylococcia (N)	3	1	0.002
CRP (mg/liter)	251	109	0.001
Time to apyrexia (days)	12	3	<10 <sup>-3</sup>

DVT: deep venous thrombosis

MRSA: methicillin resistant *staphylococcus aureus*, N: number



The multivariate logistic regression analysis confirmed CRP higher values ( $p=0.009$ ) and time to Apyrexia ( $p=0.002$ ) as independent predictive factors of DVT.

**Conclusion:** The incidence of deep vein thrombosis associated to acute hematogenous osteomyelitis was of 10% in our survey. Independent predictive factors of DVT were CRP higher rate and time to apyrexia.



**9/ Prolonged postoperative analgesic effect, when low dose of ketamine is added to a nonsteroidal antiinflammatory drug in children after thoracic surgery.**

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We evaluated the effects of adding low dose ketamine (LDK) to a multimodal postoperative analgesic regimen, including a long-acting nonsteroidal antiinflammatory drug.

**Methods:** 42 patients admitted for thoracic surgery were studied. Patients received paracetamol 2 g and miloxicam 12,5 mg IV 30 min before start anaesthesia with propofol and fentanyl. The patients were then randomized to receive LDK  $0,4 \pm 0,2$  mg/kg IV. Both groups received fentanyl 1  $\mu$ g/kg IV.

**Results:** There was no difference in pain scores or rescue medication between the groups during the first 4 h after surgery. After discharge, the median pain score during coughing or movement was 4 on a 0-10 scale in patients receiving placebo, and 2 in the patients receiving ketamine. ( $P = 0.062$ ). From 24 to 72 h, the median pain with coughing or movement in patients receiving placebo was 7, and 1 in patients receiving ketamine, which did reach statistical significance ( $P < 0.05$ ). 64% of patients receiving LDK were pain free from 4 to 24 h, compared with 26% of patients receiving placebo, a difference that did reach statistical significance ( $P < 0.05$ ). Similarly, 36% of patients receiving ketamine were pain free from 24 to 72 h, compared with 14% of patients receiving placebo ( $P < 0.05$ ). More patients had slept poorly on the first night in the ketamine group than in the control group, 72% vs 42%, ( $P < 0.05$ ).

**Conclusions:** LDK provides prolonged postoperative analgesia after operation when added to a multimodal regimen including nonsteroidal anti-inflammatory drug.



### **38/ Anaesthesia for rigid bronchoscopy of tracheobronchial foreign body removal in children**

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**Introduction:** Foreign body aspiration may be a life threatening emergency in children requiring immediate bronchoscopy under general anaesthesia. In our hospital, controlled ventilation technique with muscle relaxation and rigid bronchoscopy have been used during anaesthesia for bronchoscopic foreign body removal. This retrospective randomized study shows our experience with periinterventional airway and postextubation complications during and after general anaesthesia with muscle relaxation for rigid bronchoscopy foreign body removal.

**Methods:** We retrospectively analyzed rigid bronchoscopy charts of 31 children with suspicion of tracheobronchial foreign body aspiration during 2003- 2010. Patients characteristics, duration of fasting, depth of anaesthesia were judged clinically by hemodynamic parameters( heart rate, noninvasive blood pressure, SpO<sub>2</sub>), lacrimation and sweating, periinterventional airway and postextubation complications were taken and noted.

**Results:** A total of 31 children were included in this study. Children between 1- 2 years old were been in 61%. Positive history was found in 87% patients. A tracheobronchial foreign body was found and removed in 84%. Median fasting time before induction of anaesthesia was 5 hours. Depth of anaesthesia was adequated in all patients. Local tracheobronchial bleeding was seen in 2 patients (6%). There was 1 patient (3%) with severe arterial desaturation because of complete obstruction right principal bronchus during extraction of the foreign body. Laryngospasm at extubation was seen in 1 patient (3%). Postextubation stridor and bronchospasm were present in 6% patients.

**Conclusions:** In this study, we examined anesthetic, periinterventional and postextubation morbidity of rigid bronchoscopy for removal tracheobronchial foreign body in children. The main findings were that rigid bronchoscopy for removal of inhaled foreign body under the general anaesthesia had low incidence periinterventional and postextubation airway complications. The risk for serious complications were caused by delayed diagnosis of foreign body aspiration.



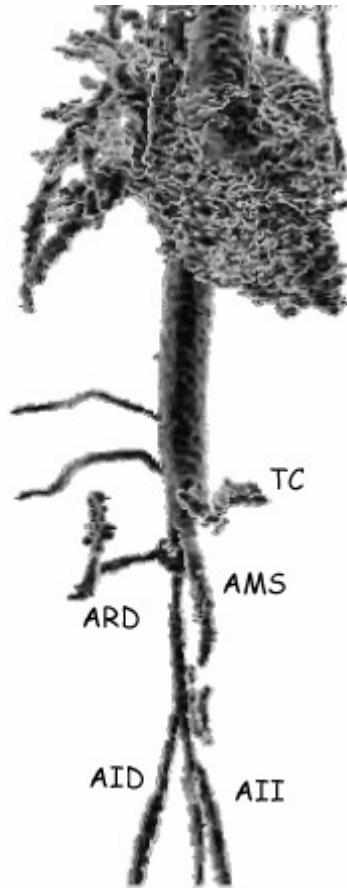
## **50/ ANAESTHETIC MANAGEMENT OF COARCTATION OF THE AORTA STENT SURGERY**

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Coarctation of the aorta is a congenital condition whereby the aorta narrows, most commonly in the descending thoracic aorta, causing aortic flow obstruction. This defect can be treated surgically or by interventional procedure.

Anaesthetic management of patients undergoing catheterization is complex, due to their clinical condition, risk of aortic rupture and the distance between the interventional radiology room and our working area, among other causes.

We present a 17 year old man, with coarctation of the abdominal aorta and severe hypertension refractory to treatment, causing disabling claudication. His parents rejected surgical treatment. Physical examination revealed a significant BP difference between upper and lower right extremities, and an abdominal murmur (III / IV). MRI (picture below) and echocardiogram showed severe coarctation of the aorta, involving both renal arteries, and hypertensive cardiomyopathy with impaired diastolic function. No anomalies were found in preoperative tests. Treatment with b-blockers was initiated to optimize BP. We performed general anesthesia with endotracheal intubation, using Sevoflurane (MAC 1) and continuous infusion of Remifentanyl (0.15 g / kg / min) for anaesthetic maintenance. During catheterization, short intervals of hypotension were required for the placement and dilatation of the stent, using Sodium Nitroprusside for this purpose. There were no changes in the ECG or oxygen saturation during the interventionism. The postoperative analgesic requirement was minimal. The patient was discharged after 48 h.



Aortic stent offers major benefits in patients excluded for surgical treatment. The challenges for the anaesthetist include the specific problems of placing the graft, the risk of aortic rupture and the unfamiliar atmosphere of the interventionism room.

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## 76/ Perioperative salvage and return of red blood cells using Ortho-PAT device in children scoliosis surgery

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**Introduction.** This presentation focuses on minimizing demand on allogenic blood transfusion in children scoliosis surgery using the Ortho-PAT device. The Ortho-PAT device has the ability collecting, washing blood and concentrating red blood cells (Hematocrit (HCT) after concentrating is 66,5 - 77 %). This device is easy portable and can be used intra- and postoperatively. It has adjustable vacuum drain suction 0-100 mmHg function postoperatively. It is easy to use and there is no need for the special operator.

**Methods and results.** Usually we use from 1 to 3 allogenic blood units for one child during scoliosis correction surgery and in early postoperative period. Allogenic transfusions carry risks on viral disease transmission, allergic reactions and post-transfusion immune suppression. Vilnius University Children hospital started to use the Ortho-PAT device in 2009. Our experience using this device is 4 children from 12 to 17 years old. We have used this device during scoliosis correction surgery and during the first six hours postoperatively in ICU. There was routine preparation before surgery, general anaesthesia with Sevoflurane, Fentanyl, Esmeron. Intraarterial blood pressure was measured in all cases. The Hemoglobin (HGB) of all patients before operation was from 128 to 158 g/l. The surgery lasted from 6 to 9 hours. Blood loss was from 950 to 2200 ml during surgery and in the first 6 postoperative hours. This blood was collected, washed, concentrated and reinfused from 220 to 770 ml autologous red blood cells. HGB of patients was from 89 to 111 g/l on the second day. Only one patient received 1 unit of allogenic blood transfusion because the Hb value fell down to 84 g/l on the third postoperative day. Other three patients were discharged without need of allogenic blood transfusion.

**Discussion and conclusions.** Perioperative salvage and return of red blood cells with Ortho-PAT device seems to be effectively reducing the requirements of allogenic blood transfusion in children scoliosis correction surgery. If the patient receives 2 or more units of donor red blood cells the Ortho-PAT System may be cost effective.

To compare statistically autologous and allogenic blood transfusion advantages, frequency of complications, including infection, fluid overload and decreased length to discharge, we need more cases and experience using Ortho-PAT device.



## **88/ CHARACTERISTICS OF OUT-OF-HOSPITAL PAEDIATRIC EMERGENCIES ATTENDED BY AMBULANCE BASED EMERGENCY PHYSICIANS**

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**INTRODUCTION:** Paediatric emergencies contribute with a small percentage to the pre-hospital emergency but require particular knowledge and skills and pose a special challenge to pre-hospital emergency personnel. The purpose of this study was to review the activity of prehospital paediatric emergency services in our institution during 12,5 years.

**METHODS:** We retrospectively evaluated all prehospital paediatric emergencies (0-18 years) within a 12,5 years period: June 1997-December 2009. Patient characteristics, dispatch reason, primary medical complaint, injury type, performed interventions and transport of the victims to the hospital were analyzed.

**RESULTS AND DISCUSSION:** The prehospital emergency services operability is about 87,80% with an average number of leaves about 180/month in which 11,7 (6,58%) are paediatric. The pre-hospital intervention in paediatric age is mainly in cases of medical emergency (81%), being trauma the main reason of activation in 19% of the leaves. In 46,9% of situations the medical intervention is fixed to clinical evaluation and monitoring without therapeutic needs. During the study period 29 children suffered from an out-of-hospital cardiorespiratory arrest (CPR). After initial CPR, sustained restoration of spontaneous circulation was achieved in 31,03 % of cases. The victims transport to the hospital was done with medical surveillance in 66,3% of the cases. In 59,7% wasn't done any medication in the scene and 2% didn't need transport to hospital. The convulsion was the main reason of activation. Despite being a small number of pre-hospital activation, the wide range of ages and pathologies, the anathomo-physiological respective singularities and emotional characteristics require from the medical pre-hospital professionals a wide range of theoretic and technical knowledgement for its resolution. The pre-hospital system provides a quick approach to various situations, allowing an unique intervention and stabilization in the scene, by trained professionals.

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