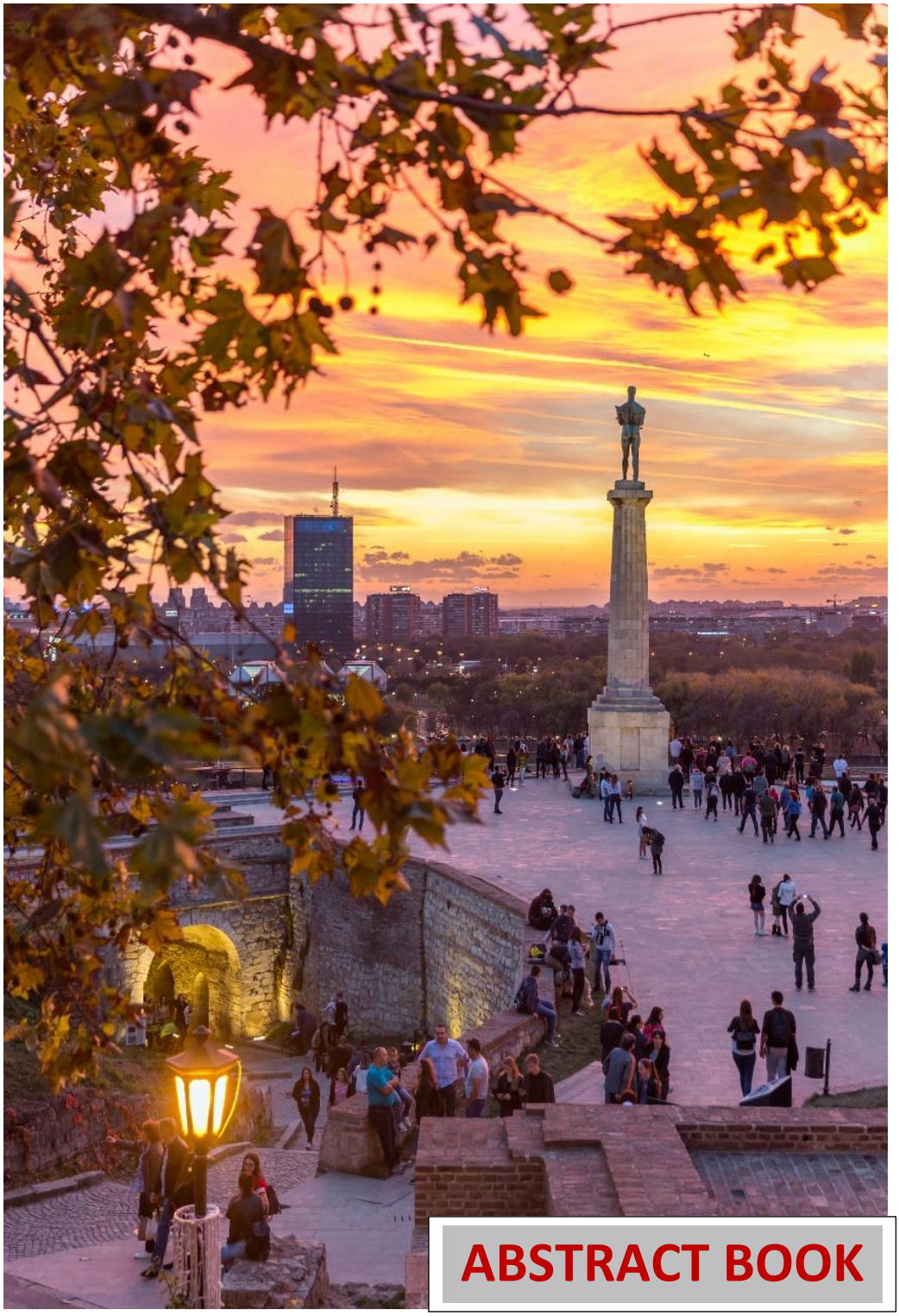
EUPSA 2019

EUROPEAN PAEDIATRIC SURGEONS' ASSOCIATION



ABSTRACT BOOK

20th ANNUAL CONGRESS OF THE EUROPEAN PAEDIATRIC SURGEONS' ASSOCIATION

BELGRADE, SERBIA - June 12th – 16th, 2019

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UG01: GUT MICROBIOTA IN CHILDREN WITH INTESTINAL FAILURE RECEIVING LONG-TERM PARENTERAL NUTRITION

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AIM OF THE STUDY

To characterise the gut microbiota composition in children with intestinal failure (IF) versus healthy controls and explore associations with clinical parameters.

METHODS

The microbiota of 66 serial faecal samples from 15 IF patients (median age 4.3 years) receiving home parenteral nutrition (PN) and of single control samples from 25 age-matched healthy children was characterised using 16S rRNA sequencing. Functional IF (motility disorders and enteropathies) was distinguished from surgical IF. Mann-Whitney U tests were used for comparison, and Spearman's rho for correlations.

MAIN RESULTS

The total bacterial load of the first sample of IF patients was lower than that of control samples ($p=0.003$). Their microbial community showed a lower α-diversity ($p<0.001$), richness ($p=0.006$) and evenness (species distribution, $p<0.001$), and a higher degree of inter-individual variation. Patients with surgical IF clustered separately from patients with functional IF (Figure 1). For all samples, PN duration was negatively associated with richness ($\beta=-0.29$, $p=0.04$), and percentage of calories provided by PN with α-diversity and richness ($\beta=-0.33$, $p=0.02$ and $\beta=-0.34$, $p=0.02$ respectively). Enteral fibre intake (g/kg) was positively associated with α-diversity ($\beta=0.42$, $p<0.01$). IF patients had a significantly higher abundance of Enterobacteriaceae, Lactobacillaceae and Staphylococcaceae, and a significantly lower abundance of Bacteroidaceae and Bifidobacteriaceae.

CONCLUSIONS

The gut microbiota of children with IF presented a lower diversity, loss of dominant microbial taxa and increased abundance of potentially harmful species, compared with that of healthy controls. Associations between microbial and PN characteristics offer the potential to use gut microbiota as biomarker in intestinal adaptation.

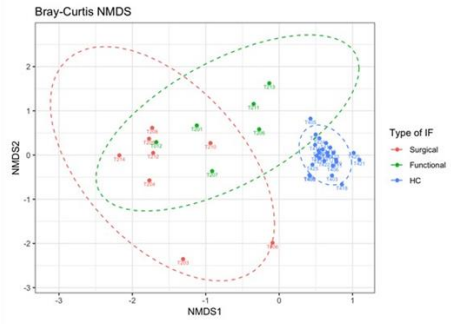

Figure 1. Non-metric multidimensional scaling (NMDS) of operational taxonomic unit (OTU) community structures for the first sample of surgical and functional intestinal failure (IF) patients and healthy controls (HC). Samples that are clustered closely together are considered to be more similar in terms of microbial species composition than samples that are more separated.

UG02: HIGH-TECH DIAGNOSTIC METHODS AND ENTEROSCOPIC TREATMENT OF CHILDREN WITH PEUTZ-JEGHERS SYNDROME

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AIM OF THE STUDY
Develop an optimal method for the diagnosis and treatment of polyps in children with Peutz-Jeghers syndrome (PJS).

METHODS
During 2015–2018 we conducted 30 comprehensive examinations of children (18 boys and 12 girls aged 10 to 17 years) with PJS in the department of endoscopic and morphological research of the XXX organization. We performed esophagogastroduodenoscopy and colonoscopy with removal of polyps more than 7 mm, then video capsule endoscopy - polyps with a diameter of 2 mm to 2.5 cm were detected in the deep sections of the small intestine. Guided by this, we made a decision to conduct therapeutic single-balloon enteroscopy. Our technique for removal of polypes is general in all parts: 1. submucosal injection of hyaluronic acid next to the polyp (creating a "resistant pillow"); 2. electroexcision of polyp; 3. clipping the removal site after polypectomy.

MAIN RESULTS
Successfully performed electroexcision of polyps, which were localized in the deep parts of the small intestine at a distance of 30 segments (1 segment is 10 cm), reached a diameter of 2.5 cm, had a long pedicle. The postoperative period was uneventful.

CONCLUSIONS
We have developed an optimal method of diagnostic and therapeutic measures, the observance of which allows us to avoid delayed perforations of the small intestine in the area of polypectomy in the postoperative period in children with PJS. Thanks to this technique, modern enteroscopy is becoming the only possible alternative to bowel resection in children with PJS.

UG03: INCIDENCE OF NECROTIZING ENTEROCOLITIS AMONG PRETERM AND VERY LOW BIRTH WEIGHT INFANTS: A GLOBAL PERSPECTIVE

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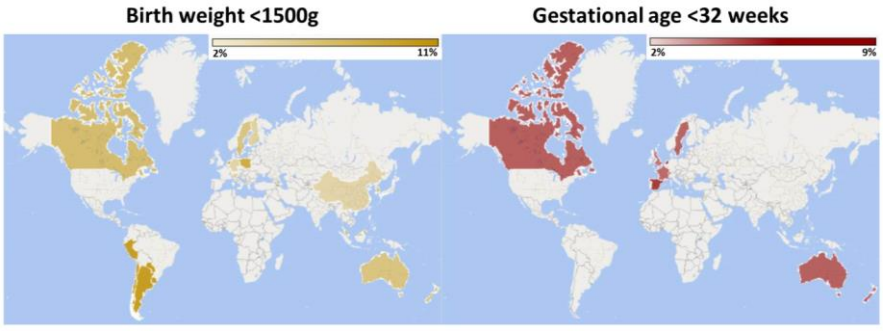
AIM OF THE STUDY
Necrotizing Enterocolitis (NEC) is considered the most severe gastrointestinal emergency among preterm neonates and is responsible for a high morbidity and mortality among this population. Incidence of NEC has been reported to vary greatly among different countries around the globe. We aimed to provide a population-based picture of the worldwide incidence of NEC.

METHODS
PubMed, Embase and Web of Science were searched using the search terms 'necrotizing enterocolitis', 'incidence', and 'epidemiology' to identify population-based studies reporting the incidence of NEC. Studies of any country in any language were included if they provided: (i) a definition of NEC (ii) clear definition of preterm population studied (birth weight [BW] <1500g and/or gestational age [GA] <32 weeks); (iv) incidence of NEC based on population-based data. To avoid duplication and double counting, the paper reporting the largest and most recent epidemiological study for a single country was selected.

MAIN RESULTS
Out of 4625 unique references retrieved, 20 studies (covering 26 countries) meeting the inclusion criteria were selected. Studies from every continent but Africa and Antarctica were found. NEC incidence among infants with BW <1500g ranged from 1.6% in Japan to 10.9% in South American countries; for infants with GA <32 weeks incidence reached up to 8.6% in the Netherlands.

CONCLUSIONS
This is the first report of a literature-based, epidemiological study identifying NEC incidence around the world. There is variation in NEC incidence which may be affected by genetic, socio-economic, and environmental factors.

Global incidence of NEC



Continent	BW <1500g	GA <32 weeks	Years
Asia	1.6-6.4%	2.5%*	1995-2014
Europe	2.7-10.0%	2.6-8.6%	1997-2013
North-America	6.2-6.9%	4.5%*	2005-2014
Oceania	5%*	4.4%*	2008-2011
South-America	10.9%*	N/A	2001-2011

*Range is not available

UG04: ILEAL MICROBIOTA IN SPONTANEOUS INTESTINAL PERFORATION IN COMPARISSION WITH NECROTIZING ENTEROCOLITIS

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AIM OF THE STUDY
Spontaneous intestinal perforation (SIP) and necrotizing enterocolitis (NEC) are devastating surgical emergencies of preterm infants caused by distinct pathophysiology.There is still no information about the role of microbiota in SIP etiology, but microbiota is proved predisposing factor for NEC. We hypothesize, that microbiota in SIP would be different from NEC.
The objective was to determine microbiota associated with SIP and to compare it with NEC.

METHODS
Ileal effluent samples and mucosa obtained during surgery for SIP and NEC Bell stage IIIb were studied. The study was approved by hospital ethics committee, informed consent was signed. The microbiota was characterized through Illumina MiSeq sequencing of the 16S rRNA gene. Taxonomic distribution was examined by QIIME statistical software, taxonomic difference by two- sample nonparametric t-test.

MAIN RESULTS
We analyzed in this prospective study 58 samples from 8 SIP and 12 NEC infants operated between I/2013 and XII/2016. SIP neonates did not significantly differ from NEC infants in gestation, day of sampling, enteral feeding or antibiotic treatment. In SIP dominated phylum *Firmicutes*, the difference from NEC was not significant (77.9% vs. 59.5%, p=0.69). In NEC we found insignificant increase in *Proteobacteria* (30.3 % vs. 13.1%, p=0.11). SIP infants were colonized mostly by genus *Staphylococcus,* NEC by *Enterococcus, Staphylococcus*, *Klebsiella* and *Bacteroides.* There was no difference in Alpha diversity (Shannon index 3.22 vs. 3.55, p=0.50).

CONCLUSION
SIP microbiota is not distinctive from NEC. Further research to elucidate its role in SIP etiology is needed.

UG05: THE USE OF NEAR INFRARED SPECTROSCOPY (NIRS) TO PREVENT ARTERIAL HYPOTENSION DURING LONG GAP ESOPHAGEAL ATRESIA SURGERY

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AIM

To identify the cut-off value of mean arterial pressure (MAP) in newborns to maintain an adequate cerebral autoregulation during esophageal atresia surgery, using NIRS.

MATERIALS AND METHODS: This is a monocentric observational study conducted in our children's Hospital. We enrolled 30 full-term newborns suffering from long-gap esophageal atresia (EA). For each patient, we collected following data: heart rate (HR), mean arterial pressures (MAP), invasive blood pressure (IBP), temperature (T), peripheral oxygen saturation (SpO_2) and cerebral regional oxygen saturation (rSO_2) at different time points: T0 (arrival of the patient); T1 (induction of anesthesia), T2 (thoracotomy), T3 (esophageal anastomosis), T4 (end of surgery). Statistical analysis was performed using the 1-way Anova (Kruskal - Wallis and Dunn's multiple comparison tests) e Mann-Whitney tests.

RESULTS

NIRS and MAP values varied significantly over time (both p = 0.0001). Comparing trends of NIRS and MAP values at the same time points, we observe a similar trend but not a significant correlation (p = 0.07).

CONCLUSIONS

NIRS values showed a significant variation throughout the surgical procedure in newborns, while, MAP seems not to be a predictive index of poor cerebral perfusion in newborns. The application of NIRS could optimize the anaesthesiological choices by changing from inhalation to intravenous drugs, avoiding absolute or relative hypovolaemia related to bleeding or hemodilution, minimizing the intra and post-operative ischemic insult and assuring an adequate cerebral perfusion.

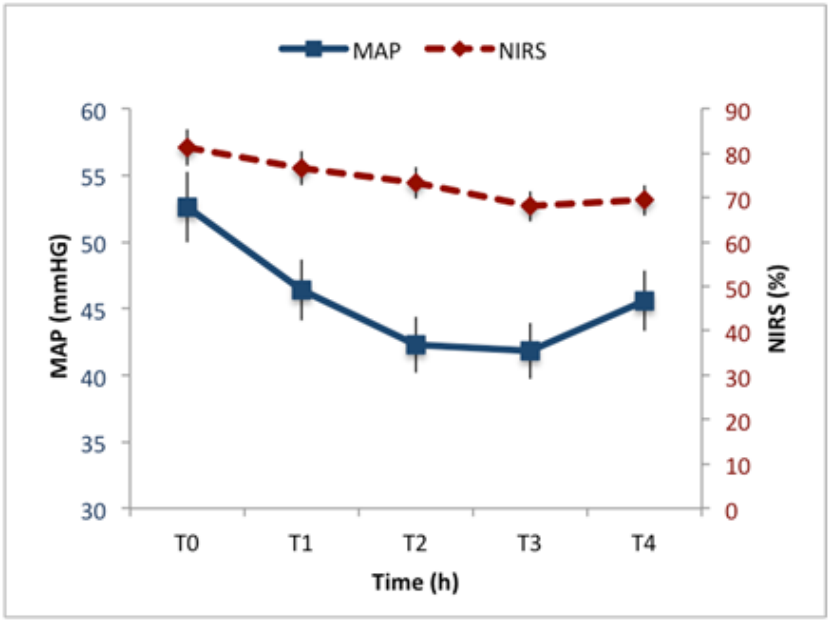

Table 1. Trends of MAP and NIRS values.

UG06: LAPAROSCOPIC ASSISTED GASTRIC PULL-UP INCLUDING PYLORIC DILATATION IN LONG-GAP ESOPHAGEAL ATRESIA: TECHNIQUE AND OUTCOME

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AIM
We report technique and functional results after laparoscopic assisted gastric pull-up (LGPU) in patients with long-gap esophageal atresia (LGEA).

METHODS
Retrospective analysis of 13 children with LGEA (7xII, 3xIIIA, 1xIIIB, 1xIIIC. Four patients had VACTERL). Using three ports, surgical steps included releasing the gastrostomy, transumbical section of the stomach including pyloric balloon-dilation, and laparoscopic transhiatal retromediastinal GPU for cervical anastomosis.

MAIN RESULTS
Until the operation patients gained weight through a gastrostomy and oral feeding was trained through a cervical esophagostomy (early study period) or a suction tube. The average age at LGPU was 137 days (33 – 266), body weight 5,4kg (3,1 – 8,3). Operation time was 235 minutes (155 – 383), one conversion was necessary (splenic bleeding). Time under mechanical ventilation was 5 days (1 – 24). Transanastomotic tube feeding began after 1 day, oral feeding after 12 days. Three patients had transient Horner's, 1 patient developed pleural effusion (recurrent chest tube insertion). After follow-up of 79 months (6 – 240) all children have functional grafts, weight gain and oral feeding without dumping or reflux. Five patients with congenital heart defects/Down's/dysphagia required a temporary jejunostomy. Mild anastomotic (4) or pyloric (5) stenosis was resolved with endoscopic dilatations.

CONCLUSION
Functional outcome after LGPU in patients with LGEA is good. The laparoscopic retrocardial preparation preserves vascular and nerval structures especially in patients with cardiac anomalies or previous operations. This technique including a pyloric dilatation may also prevent dumping syndrome even though additional dilatations may be required in some cases.

UG07: TOTAL OESOPHAGOGASTRIC DISSOCIATION FOR THE TREATMENT OF GASTROESOPHAGEAL REFLUX IN NEUROLOGICALLY IMPAIRED CHILDREN: 18 YEARS' EXPERIENCE AND LONG-TERM FOLLOW-UP

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AIM
As fundoplication in neurologically impaired children carries 16%-38% failure rate, total oesophagogastric dissociation (TOGD) was proposed as an alternative. This study aimed to evaluate TOGD's feasibility and efficacy in the long run both for primary and rescue procedures.

METHODS
30 patients (12 female) who underwent TOGD between 2000 and 2018 in two Centres were retrospectively reviewed: 23 primary procedures and 7 rescue procedures. Inclusion criteria were: severe neurodisability (GMFCS level V), intractable gastroesophageal reflux and dysphagia.

RESULTS
Preoperatively, children showed regurgitation, vomiting or retching and 93% unsafe swallow. They experienced recurrent chest infections and several days of hospitalization per year (see Figure attached). Median relative weight was 77%. All patients used antireflux therapy. Median age at surgery was 6,48 years (range: 0,69 – 22,18). There was no perioperative mortality and 5 late deaths (17%) unrelated to surgery. Early complications were 9 (30%), 3 of which required surgical intervention: one small bowel obstruction, one midgut volvulus and one intractable pyloric spasm. Gastrostomy feeding was established after a median time of 8 days (range: 6 – 17) and median hospital stay was 22,5 days (range: 15 – 97). Late complications were 4 (13%), with 3 operations required (one bowel occlusion, one laparocele, one transhiatal hernia). Median follow-up was 3,5 years (range: 0,6 – 17,7). See Figure attached for long-term results.

CONCLUSIONS
In our experience with neurologically impaired children, TOGD proved to be an effective procedure also in the long run with an acceptable complication rate, with no substantial differences between primary and rescue procedures.

	Preoperative data	*Postoperative data*	*p-value*
Vomit/regurgitation, n° patients (%)	26 (87%)	0 (0%)	< 0.0001
Relative weight, median (range)	77% (48% - 118%)	101% (54% - 154%)	0.002
N° pneumonia/year, median (range)	1.3 (0 – 14.4)	0.06 (0 – 12.93)	< 0.0001
N° hospital days/year, median (range)	37.14 (0 – 324)	0.88 (0 – 49.15)	< 0.0001
Use of antireflux therapy, n° patients (%)	30 (100%)	8 (27%)	< 0.0001
QoL according to O'Neill questionnaire, mean total score (SD)	39.1 (± 3.2)	20.9 (± 3.4)	< 0.0001

UG08: INTRAMURAL INJECTION OF BOTULINUM TOXIN A IN SURGICAL TREATMENT OF LONG GAP ESOPHAGEAL ATRESIA – RAT MODEL

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AIM OF THE STUDY
Determine if botulinum toxin A (BTX-A) can increase the elasticity of the esophagus (part 1) and enable primary anastomosis with reduced tension evaluated by leak, stenosis rate and histology (part 2).

METHODS
Part 1: Adult male Wistar rats (n = 46) were randomly assorted to 4 groups. The groups received 2 or 4 U/kg of BTX-A or saline (control) delivered using 2 or 4 intraesophageal injections. A 1.5 cm segment of esophagus was removed 6 or 24 hours post injection and placed in a stretch tension device for measurement of maximum elongation and load.
Part 2: Animals were randomly assorted to injection of BTX-A (2 U/kg) or saline, and 24 hours post injection, 0.5 cm of the esophagus was resected and end-to-end anastomosis was performed. Animals were observed for 10 days and macroscopical and histology evaluation of the esophageal anastomosis was compared.
MAIN RESULTS
Part 1: Elongation in the BTX-A 2 U/kg, 24-hr, 4-injection group (8.56mm ±1.08) was significantly greater compared with saline group (6.51mm ±0.39, p≤0.01) and maximum load was significantly lower (Table 1).
Part 2: Preliminary results after 4 animals demonstrated esophageal stricture formation in the saline treated animals and inflammatory histological differences between the two groups.
CONCLUSION
Part 1: We found that BTX-A leads to increased elasticity of esophageal tissue in rats, as evidenced by increasing elongation and lowering of maximal load.
Part 2: Early results of ongoing chronic esophageal resection studies suggest botox could potentially prevent esophageal stricture.

Table 1. Elongation from pre-conditioning to max load for anastomotic bursting point for Saline and BTX-A (2 U/kg) at different time intervals from injection.

Assessments	Treatment Group	Mean ± SD	Range	p-Value
Elongation (mm)	Saline; 6h and 2 injections	6.51±0.39	5.97-6.9	
	BTX-A 2 U/kg; 6h and 2 injections	7.81±1.63	6.10-10.9	p≥0.05
	BTX-A 2 U/kg; 6h and 4 injections	7.79±1.22	6.29-9.63	p≥0.05
	BTX-A 2 U/kg; 24h and 4 injections	8.56±1.08	7.49-9.85	p≤0.01*
Maximum Load (N)	Saline; 6h and 2 injections	10.42±1.21	8.63-12.1	
	BTX-A 2 U/kg; 6h and 2 injections	9.18±0.80	7.86-10.46	p≥0.05
	BTX-A 2 U/kg; 6h and 4 injections	7.42±2.85	2.31-10.13	p≥0.05
	BTX-A 2 U/kg; 24h and 4 injections	5.98±2.04	2.3-8.94	p≤0.01*

*Value is statistically significant

UG09: RESULTS OF THE ERNICA CONSENSUS CONFERENCE ON THE SURGICAL MANAGEMENT OF PATIENTS WITH ESOPHAGEAL ATRESIA WITH TRACHEOESOPHAGEAL FISTULA

Carmen Dingemann[1], Simon Eaton[2], Gunnar Aksnes[3], Pietro Bagolan[4], Kate Cross[5], Paolo De Coppi [5], JoAnne Fruithof[6], Piergiorgio Gamba[7], Steffen Husby[8], Antti Koivusalo[9], Lars Rasmussen[10], Rony Sfeir[11], Graham Slater[12], Jan F. Svensson[13], David Van der Zee[14], Lucas Wessel[15], Anke Widenmann-Grolig [16], René Wijnen[17], Benno M. Ure[1]

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AIM OF THE STUDY

Many aspects of the management of esophageal atresia (EA) and tracheoesophageal fistula (TEF) are controversial and the evidence for decision making is limited. The European Reference Network for Rare Inherited Congenital Anomalies (ERNICA) organized a consensus conference on the management of EA/TEF based on expert opinions referring to the latest literature.

METHODS

Nineteen ERNICA representatives from 9 European countries participated. The conference was prepared by: (i) item generation, (ii) item prioritization on a 5-point scale by online survey, (iii) formulation of a final list containing the domains diagnostics, preoperative, operative and postoperative management, (iv) literature review. The 2-day conference was held in Berlin in October 2018. Anonymous voting was conducted via an internet-based system using a 1-9 scale. Consensus was defined as ≥75% of those voting scoring 6-9.

MAIN RESULTS

Fifty-two items were generated with 116 relevant articles of which only 5 studies (4.3%) were assigned Level-1-evidence. Complete consensus (100%) was achieved on 20 items (38%), such as closure of TEF by transfixing suture, esophageal anastomosis by interrupted sutures, initiation of oral feeding 24 hours postoperatively. Consensus ≥75% was achieved on 37 items (71%), such as routine insertion of transanastomotic tube or maximum duration of thoracoscopy of 3 hours. Thirteen items (25%) were controversial discussed [range 1-9] of which 8 items (62%) did not reach consensus.

CONCLUSIONS

Consensus was achieved on many aspects regarding the management of EA/TEF patients. The consensus statements will facilitate standardization and development of defined pathways for patient care.

UG10: AN EXPERIMENTAL STUDY ON MAGNETIC ESOPHAGEAL COMPRESSION ANASTOMOSIS IN PIGLETS

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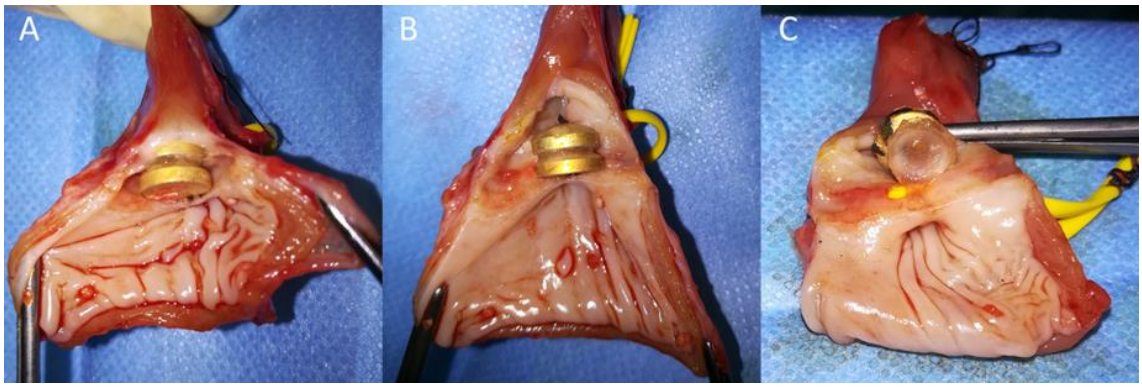
INTRODUCTION
Fashioning a patent, watertight anastomosis in patients with esophageal atresia is a challenging tasks in pediatric surgery, particularly when performed under tension. A reproducible suture-less alternative would decrease operative time. We evaluated magnetic esophageal compression anastomoses in a novel bypass-loop swine model.

MATERIALS AND METHODS
Eight-week-old piglets underwent thoracotomy to mobilize the esophagus at the carinal level to create a U-shaped loop. Custom-made Neodymium Magnets (N52 grade, 8 mm diameter) were inserted into the esophagus proximal and distal to the loop, and mated side-to-side at the future anastomosis site. Pigs were observed for 8 (n=4), 10 (n=6), and 12 (n=2) days and then sacrificed. The magnetic compression anastomosis was evaluated macroscopically, by contrast radiography, burst pressure testing, and histology.

RESULTS
All 12 pigs survived until the endpoint. Separation of the magnets occurred at a median of 9 days (figure 1). Contrast esophagrams showed no leak and patency. All anastomoses withstood pressures well over 13kPa (100 mmHg) without leak. Histopathology showed circular scar tissue covered by epithelium.

CONCLUSION
Magnetic compression anastomoses of the esophagus using our specially-designed magnets are usually formed between the 8th and 10th postoperative day, are patent and mechanically resistant to supraphysiologic intraluminal pressures. These data lay the basis for a potential clinical application in patients born with esophageal atresia.

Figure 1: Early magnetic anastomosis formation at postoperative day 8. The magnets are firmly embedded in the tissue (A, B). . The necrotic tissue disk with the developing anastomotic lumen in the center is seen in (C).



UG11: REVERSED GASTRIC TUBE IN CHILDREN: A FIFTEEN YEAR EXPERIENCE

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AIM OF THE STUDY
To present our experience with children managed by reversed gastric tube esophagoplasty and to evaluate short and long term complications.

METHODS
A retrospective study including 28 patients managed by reversed gastric tube esophagoplasty in the department of pediatric surgery B during 15 years.

MAIN RESULTS
Gastric reversed tube was performed in 28 children. Ten patients had esophageal atresia and 18 had caustic stenosis. The age at the operation ranged from 6 months to 14 years. The tube was passed through the esophageal bed in all cases. Anastomosis was cervical in 21 cases and thoracic in 7 cases. There was no early or late death. Eleven patients (39%) developed cervical leak with spontaneous closure except in one case that necessitated surgical intervention. Ten patients (35,7 %) presented anastomosis stenosis that needed endoscopic dilatation. None of these patients required surgical revision. The mean follow-up was of 75 months. Five patients developed symptoms of reflux. Five patients continue to present late respiratory benign symptoms. Excellent and good functional outcome was achieved in 96% of the patients. All the patients, except one, had normal swallowing. Two patients had not undergone a weight catch-up phase. Mild tortuosity of the gastric tube had been encountered only once.

CONCLUSION
Reversed gastric tubes have proved to be a useful and satisfactory substitute for the esophagus. It has remarkably low morbidity and mortality with satisfactory functional results. This technique is a safe and easy surgical alternative procedure for esophageal replacement in children.

UG12: FEEDING DIFFICULTIES IN CHILDREN AND ADOLECENTS WITH REPAIRED ESOPHAGEAL ATRESIA – PREVALENCE AND CLINICAL PREDICTORS

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AIM OF THE STUDY

To describe how the prevalence and character of feeding difficulties differentiate amongst young-, school-aged-, and teenaged children with repaired esophageal atresia (EA), and to determine clinical predictors of feeding difficulties during the child's first hospital stay.

METHODS

Following ethical study approval, a parent-reported questionnaire concerning nine difficulties in EA-children's nutritional intake situation was used among 128/136(94%) families of 2-17 year-old EA patients in 2016. All patients were surgically treated at the same tertiary pediatric surgical center. Neonatal and clinical/surgical data was collected from medical records. In the analysis, 14 patients were excluded due to genetic disorders. Prevalence n(%) of feeding difficulties was compared between child age-groups (2-7/8-12/13-17years) using Mantel-Haenszel chi-square test. Logistic regression identified outcome predictors (OR:95%CI). Predictors with p≤0,1 in the univariable analysis were included in multivariable regression analysis (p<0.05).

MAIN RESULTS

73(64%) patients had at least one feeding difficulty of those presented in Table 1 (median 2, range 1-9). The prevalence of "avoiding certain food" (39%/20%/17%), "texture-modifying meals" (33%/5%/0%), "eating small portions" (33%/10%/14%) and "requiring support by adult during meals" (25%/10%/3%) decreased significantly with increasing child-age. Approximately 50% in all age-groups needed "increased fluid intake during meals". Several clinical/surgical predictors of feeding difficulties were identified; independent predictors are presented in Table 1.

Conclusions: Feeding difficulties are commonly reported amongst children with repaired EA, especially during early childhood. Both congenital and surgical factors are predictors to a complicated nutritional intake situation, and surgical complications predict severe feeding difficulties.

TABLE 1: RESULT FOLLOWING MULTIREGRESSION ANALYSIS TO IDENTIFY INDEPENDENT PREDICTORS OF FEEDING DIFFICULTIES IN CHILDREN AND ADOLESCENTS WITH REPAIRED ESOPHAGEAL ATRESIA AGE 2-17 YEARS

FEEDING DIFFICULTY	INDEPENDENT PREDICTOR	OR(95 % CI)	p-value
THE CHILD AVOIDS FOOD THAT IS DIFFICULT TO EAT OR SWALLOW	No independent predictors were identified		
THE CHILD IS EATING SMALL PORTIONS SO THAT IT IS EASIER TO EAT	- VACTERL* - Anastomotic leakage following esophageal repair during first hospital stay - Sepsis verified with blood culture during first hospital stay	3,96(1,07-14,63) 5,69(1,43-22,65) 9,78(2,82-33,89)	0,039 0,014 0,001
THE CHILD NEEDS ENERGY ENRICHED FOOD	Birth weight <2500g	3,18(1,08-9,37)	0,036
THE CHILD NEEDS TEXTURE-MODIFIED MELAS TO FACILITATE EATING	No independent predictors were identified		
THE CHILD IS TAKING A LONG TIME (>30 MINUTES) TO FINISH A MAIN MEAL	- VACTERL - Stricture of the esophageal anastomosis that needed dilatations during first hospital stay	3,73(1,20-11,56) 4,83(1,30-17,94)	0,023 0,019
THE CHILD NEEDS INCREASED FLUID INTAKE DURING MEALS TO FACILITATE SWALLOWING	Premature (<37 weeks of gestational age)	2,59(1,12-5,69)	0,018
THE CHILD NEEDS TO BE FED THROUGH A GASTROSTOMY	Anastomotic leakage following espohageal repair during first hospital stay	9,30(2,01-43,02)	0,004
THE CHILD NEEDS TO BE FED THROUGH AN INFUSION PUMP	Anastomotic leakage following espohageal repair during first hospital stay	12,53(2,45-64,15)	0,020
THE CHILD NEEDS SUPPORT BY ADULT DURING MEALS	No independent predictors were identified		

*Vertebral anomalies, Anorectal malformations, Cardiovascular anomalies, Tracheoesophageal fistula, Esophageal atresia, Renal and/or radial anomalies, Limb defects.

LG01: LONG-TERM OUTCOMES OF THE DUHAMEL PULL-THROUGH: A 35-YEAR INSTITUTIONAL SERIES WITH CONTINENCE AND FUNCTIONAL OUTCOMES TO ADULTHOOD

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AIM OF THE STUDY

To describe long-term bowel function outcomes for patients treated for Hirschsprung's disease (HSCR) over 35 years.

METHODS

After ethical approval (17/LO/1692), all traceable patients operated at our institution for HSCR 1978-2013 were invited to complete the Bowel Function Score (BFS) in comparison to published healthy controls.

MAIN RESULTS

Of 428 patients (71% rectosigmoid, 76% male) 95% survived. 83% had undergone Duhamel pull-through (17% laparoscopic). Complications included redo surgery (8.1%), leak (4.7%), spur (11%) and enterocolitis (14%).

139/296(47%) patients with normal cognition returned questionnaires (median age 26; range 5-41; 68% male). Respondents represented the whole cohort in terms of operative technique, segment length, and post-operative complications. 8(6%) patients had a stoma, and none ACE. Mean BFS for all patients was lower than the normal population controls' (15.9(3.4) vs 19.2(1.3), $p<0.0001$), 67 (51%) had normal BFS$\geq$17, and 11(8.4%) had poor outcome (BFS<11).

Regarding outcomes from Duhamel pull-through, Adults (>18 yrs) reported improved symptoms compared to children for rectal sensation (1.83(1.16) vs. 2.43(0.73), $p<0.005$) and soiling (2(0.93) vs 2.39(0.81), $p<0.05$). The level of aganglionosis (16.1 vs 16 vs 14.8 p=NS) or redo surgery (15 vs 16.1, p=NS) had no effect of BFS.

CONCLUSIONS

In patients with HSCR, we demonstrate significantly inferior bowel function compared to healthy population Although BFS remains subnormal, soiling and rectal sensation appear to improve with time following Duhamel pull-through.

LG02: UROLOGICAL ANOMALIES IN 546 DUTCH PATIENTS WITH ANORECTAL MALFORMATIONS: WHAT CAN WE LEARN FROM CURRENT SCREENING METHODS?

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INTRODUCTION
Screening for urological anomalies is advocated in patients with anorectal malformations (ARM). However, the extent and methods used differ with the complexity and within clinical guidelines. Our aim was to investigate the incidence of urological anomalies, the screening methods used and their urological treatment implications in complex versus less complex ARM.

MATERIAL AND METHODS
The medical records of 546 patients treated between 1983 and 2018 were evaluated retrospectively. ARM classification, screening methods used, and implications for urological treatment were studied. Perineal and vestibular fistulas were considered less complex. All other, previously qualified as “higher” malformations, were considered complex.

RESULTS
Urological anomalies occurred in 57% and significantly more often in complex cases (82% versus 42%, p = 0.000). The most common anomalies were hydronephrosis (27%), vesico-ureteral reflux (VUR) (23%) and urinary tract infections (21%). A voiding cysto-urethrography (VCUG) and/or renal ultrasound were performed in 90%, both studies in 56%. VUR without hydronephrosis but with urological treatment implications occurred in 14%, independent of the complexity of ARM.

CONCLUSION
Over 80 % of complex ARM have associated urological anomalies. Despite a prior normal ultrasound, VUR with subsequent therapeutic implications was detected in 14% of the patients. Therefore, as normal renal ultrasound does not exclude VUR, both renal US and VCUG are indicated in all ARM-patients.

LG03: COLONIC ATRESIA CHARACTERISTICS, MANAGEMENT, AND OUTCOME: A STUDY FROM THREE HIGH VOLUME CENTERS

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AIM OF THE STUDY

Colonic atresia (CA) is a rare congenital anomaly, whose characteristics and management are based on case reports or small series. Our aim was to analyze the features and outcome of infants born with CA that were managed in three high-volume centers.

METHODS

Following ethical approval, we reviewed the charts of all infants with CA consecutively managed between 2000 and 2018. Data included demographics, associated anomalies, diagnostic workup, management, and outcome. Comparisons were made using Fisher's exact-test and Student t-test. Data are expressed as mean±SD.

MAIN RESULTS

During the study period, 40 infants with CA were managed at the three institutions. Demographics and associated anomalies are reported in **Table**. The prematurity rate (<37 weeks) was 47% and low birth weight rate (<2.5kg) was 41%. Diagnosis was timely made in 93% of neonates either with preoperative contrast enema or intraoperatively. However, CA was diagnosed later in three infants with gastroschisis that following closure developed intestinal obstruction. CA was repaired with primary anastomosis in 25 infants and colostomy formation in 15. The mortality rate was 13% and not CA related. Overall, the length of hospital stay was 106±80 days, but it was longer in preterm (141 days) compared to term infants (39 days; p<0.01).

CONCLUSIONS

In our experience that comes from the largest series ever reported, CA infants are a fragile population, as almost half are born premature and two-thirds have associated anomalies. Efforts should be made not to overlook CA when repairing an abdominal wall defect.

Table

Demographics	
Male : female	21 : 19
Birth weight (weeks)	37±3
Gestational age (kg)	2.7±0.7
Associated anomalies	
Overall	29 (72%)
Small bowel atresia	15 (37%)
Abdominal wall defects	11 (27%)
Hirschsprung's disease	2 (5%)
Other	4 (10%)

LG04: 'TUFT' CELLS: A NEW PLAYER IN HIRSCHSPRUNG'S DISEASE

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AIM OF THE STUDY

'Tuft' cells, also known as brush or caveolated cells, are characteristically fusiform shaped, with a distinct apical 'tuft' of microvilli extending into the lumen. Double cortin-like kinase 1 (Dclk1) is a microtubule kinase and is a specific marker of intestinal tuft cells. Dclk1-positive tuft cells have been shown to play a key role in gastrointestinal chemosensation, inflammation, and neurotransmission. Dclk1 and Choline acetyltransferase (ChAT), the enzyme responsible for acetylcholine production, are reported to be co-expressed in both tuft cells and nerves within the gastrointestinal tract. We designed this study to investigate the hypothesis that *Dclk1* gene expression is altered in Hirschsprung's disease (HSCR).

METHODS

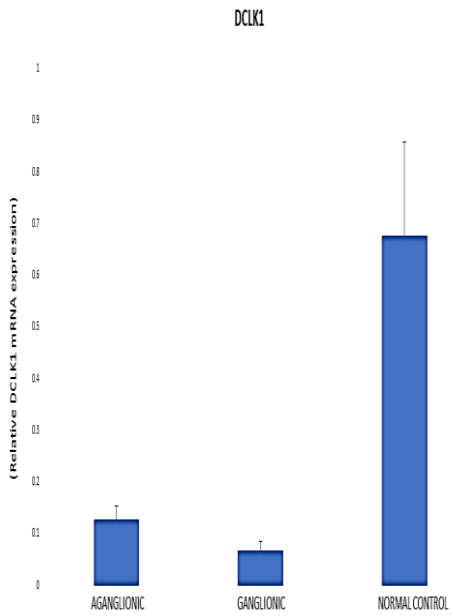
HSCR tissue specimens (n=6) were collected at the time of pull-through surgery, while control samples were obtained at the time of colostomy closure in patients with imperforate anus (n=6). qRT-PCR analysis was undertaken to quantify *Dclk1* gene expression, and immunolabelling of Dclk1-positive tuft cells was visualized using confocal microscopy.

MAIN RESULTS

qRT-PCR analysis revealed significant downregulation of the *Dclk1* gene in both aganglionic and ganglionic HSCR specimens compared to controls ($p<0.05$) (Figure). Confocal microscopy revealed Dclk1-positive tuft cell expression within the colonic mucosa, with a reduction in expression in both aganglionic and ganglionic HSCR colon compared to controls.

CONCLUSIONS

Dclk1 is significantly downregulated in HSCR colon, suggesting a role for tuft cells in cholinergic neurotransmission of the distal colon. The marked decrease in Dclk1 expression within ganglionic specimens highlights the physiologically abnormal nature of this segment in HSCR patients.



LG05: IMMUNOTHROMBOSIS IN THE GUT OF NEONATES WITH NECROTISING ENTEROCOLITIS (NEC): COULD THIS BE A NEW TARGET FOR THERAPY?

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AIM

To demonstrate whether neutrophil extracellular traps (NETs) are present in the intestine of neonates with surgical NEC.

METHOD

Following Ethical approval (18/LO/0646), we compared specimens from 10 neonates with acute stage IIIb NEC who underwent intestinal resection with normal infant intestine (n=10). H&E and Immunohistochemistry were used to demonstrate histology and the presence/distribution of the following specific biomarkers of NETs: neutrophil elastase (NE), myeloperoxidase (MPO), Toll-Like-Receptor-4 (TLR4) and citrullinated Histone H3 (H3cit). We mapped the intestinal specimen to identify NETs in the mesenteric vessels and intestinal wall. Each specimen was graded from 0-4 (0=negative and 4=maximal expression). Mann-Whitney Test was used ($P<0.05$ for significance).

RESULTS

MPO and H3cit expression was significantly higher compared to controls in both the mesenteric vessels (median 1 vs. 4, p=0.003; 0 vs. 3, p=0.02, Fig) and the intestinal wall (2.5 vs. 1, p=0.005; 2.5 vs. 0, p=0.03, Fig). High MPO expression confirmed neutrophil activation and venous thrombosis. High H3cit levels confirmed presence of NETs and was associated with tissue injury and microvascular thrombosis. H&E staining demonstrated thromboses in the mesenteric vessels.
Expression of TLR4 and NE in either the mesenteric vessels (3 vs. 3 p=0.5; 3 vs. 3, p=0.5) or the intestinal wall (3 vs. 3, p=0.3; 3 vs. 1, p=0.3) was similar to control.

CONCLUSION

We confirmed the presence and distribution of extensive NETosis in the intestine and mesenteric vessels of infants with surgical NEC. Further investigations in this area may lead to the discovery of novel treatments for NEC.

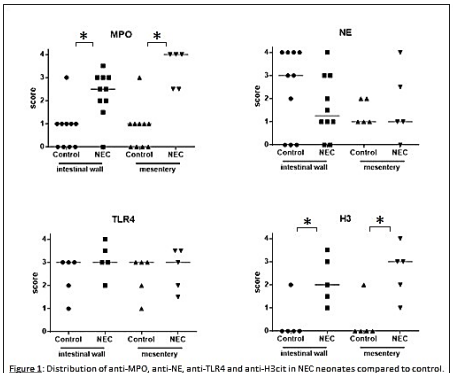

Figure 1: Distribution of anti-MPO, anti-NE, anti-TLR4 and anti-H3cit in NEC neonates compared to control. (*p<0.05)

LG06: THE IMPACT OF ANTI-TUMOR NECROSIS FACTOR ALPHA THERAPY ON POSTOPERATIVE COMPLICATIONS IN PEDIATRIC CROHN'S DISEASE

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AIM OF THE STUDY
Evaluation of the 30-day postoperative complication rates among pediatric Crohn's disease (CD) patients after abdominal surgery with or without previous exposure to anti-tumor necrosis factor alpha therapy (anti-TNF-α).

METHODS
A retrospective chart review was performed on pediatric CD patients who underwent abdominal surgery between 2014 and 2018. Patients were divided into two groups based on treatment with anti-TNF-α within 90 days before surgery. Thirty-day postoperative outcomes were compared.

MAIN RESULTS

Sixty-four patients (39 male) were included with median age of 16 years (range 7 - 19) at the time of operation and 13 years (range 2 - 17) at the time of diagnosis. Median of follow up was 23 months. The most common surgery was ileocecal (75 %). Forty-three (67 %) patients received preoperative anti-TNF-α and a median of 17 months of total anti-TNF-α use before having an operation (IQR 6 – 35). The last dose in all patients was within 90 days before surgery. The overall postoperative complication rate was 13 %. There was no statistically significant difference in the postoperative complication rate (surgical site infections, non surgical site infections, ileus, readmission, return to the operating room) between patients who received anti-TNF-α before surgery and those who did not (12 % vs 14 %; p = 0.7628).

CONCLUSIONS
The use of anti-TNF-α in pediatric CD patients within 90 days before abdominal surgery in the author's institution was not associated with an increased risk of 30-day postoperative complications.

LG07: QUALITY OF LIFE OUTCOMES TO ADULTHOOD IN HIRSCHSPRUNG'S DISEASE: A 35-YEAR INSTITUTIONAL SERIES WITH COMPARISON TO CONTROLS

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AIM OF THE STUDY
To describe the health-related quality of life (QoL) outcomes for patients treated for Hirschsprung's disease (HSCR) over a 35-year period.

METHODS
After ethical approval (17/LO/1692), all traceable patients operated at our institution for HSCR 1978-2013 were invited to complete validated Quality of Life questionnaires. Results were compared to published normative data.

MAIN RESULTS
Of 428 patients (71% rectosigmoid HSCR), 95% survived. 83% had undergone a Duhamel pull-through. Complications included redo surgery (8.1%), leak (4.7%), spur (11%) and post-operative enterocolitis (14%). 139/296(47%) patients with normal cognition returned questionnaires (median age 26; range 5-41;68% male). The respondents represented the whole cohort in terms of operative technique, segment length, and incidence of post-operative complications.

In patients under 12, PedsQL scores suggested clinically significant, moderate to major reduction in general quality of life whereas scores were normal inpatients aged 13-18. Children with a stoma (n=4) were among the lowest ranked in their age group. Similarly, in adult patients, overall GIQLI scores were significantly lower among adult patients with an enterostomy (n=4, $p<0.01$).

There was a highly significant relationship between bowel function and GIQLI scores (R=0.73, p<0.00001.). SF-36 scores were signficiantly lower in several domains compared to normal population data (Table)

CONCLUSIONS
In patients affected by HSCR, we demonstrate a significantly inferior quality of life compared to healthy population, which associates with bowel function and is sustained through to adulthood.

Table - SF-36 QoL domains in Adult patients vs. controls from normal population

SF-36 Domain	HSCR Population (n=107)	Controls (n=399)	p-value
Physical functioning	93% (17.6)	92.4% (14.6)	NS
Physical limitations to role	82% (33.5)	87.1% (29.3)	NS
Emotional wellbeing and mental health	67% (23.2)	75.9% (15.7)	p < 0.0001
Emotional limitation to role	75% (38.3)	82.9% (32.3)	p = 0.03
Social function	78% (27.5)	86.3% (20.3)	p = 0.0006
Energy and vitality	57% (26)	64.9% (17.7)	p = 0.0003
Pain	78% (26.7)	77.0% (21.8)	NS
General health perception	62% (26.5)	77.9% (15.5)	p < 0.0001

LG08: A PROSPECTIVE, RANDOMIZED, TRIAL COMPARING EFFICACY OF POLYETHYLENE GLYCOL VERSUS POLYETHYLENE GLYCOL WITH TOPICAL DILTIAZEM IN TREATING PEDIATRIC ANAL FISSURE

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BACKGROUND
Anal fissure (AF) is a common condition affecting children and is usually treated with laxatives and/or topical agents. Topical sphincter relaxing agents such as calcium channel blockers (CCB) have gained popularity as an effective treatment for AF among adults. We hypothesize that due to the superior efficacy of Polyethylene glycol (PEG) in treating constipation in children, adding topical CCB to PEG might not improve healing of AF.

METHODS
Children ≤14 years with anal fissure presented to the pediatric surgery clinic between November 2014 and March 2016 were recruited. Randomization was performed to either PEG with Diltiazem (DTZ) or PEG with placebo. Study personnel, patients, and their families were blinded. Primary outcome was healing of the anal fissure as documented by physical examination or the resolution of symptoms. Secondary outcome was constipation and treatment complications at 12-week follow up.

RESULTS
48 patients were randomized: 24 to PEG + DTZ and 24 to PEG + placebo. Both groups were similar in their baseline characteristics. Median age was 26.5 and 32 months in the DTZ and placebo groups respectively. At week 12, majority of patients' symptoms have improved without significant difference between groups; painful defecation at week 12: 26.3% and 11.8% (p-value 0.4), blood per rectum at week 12: 5.3% and 12.5% (p-value 0.58) in the DTZ and placebo groups respectively. Additionally, there was similar improvement in constipation in both groups.

CONCLUSION
PEG alone was associated with similar improvement in anal fissure symptoms in children compared to PEG and topical diltiazem combined.

LG09: MOWAT WILSON SYNDROME AND HIRSCHSPRUNG DISEASE: LONG TERM FUNCTIONAL OUTCOMES

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AIM OF THE STUDY
Mowat Wilson Syndrome (MWS) is a complexe congenital disorder due to mutation or deletion of the ZFHX1B gene, in which multiple clinical features have already been described. Hirschsprung was described as a part of this syndrome with a prevalence between 43% and 57%.
We aimed to demonstrate the severe outcomes and the high complication rate of children with this syndromic association, focusing on their complicated follow up.

METHODS
A single institution retrospective study was conducted from 2003 to 2018 in children with MWS. Children were followed up by surgeons, geneticians, gastroentrologists and neurologists. Patient's characteristics, surgical management, postoperative complications and functional outcomes were collected.
Main results: in 15 years 23 patients with MWS were followed up. Hirschsprung disease was associated in 10 of them (43%). On these cases, 4 presented a total colonic aganglionosis (40%) and 6 rectosigmoid localization (60%).
Median follow-up was 8.5 years (2 months – 15 years). Three patients still have stoma diversion, one died during the first year of life, two are stable now (one initially required a stoma diversion), two still suffers from periodic abdominal distention and pain. Six of them (60%) underwent at least one surgery for complications related to this pathology. Two patiens required botulinic toxin injections.

CONCLUSIONS
MSD associated with Hirschsprung has an overall high rate of surgical complications and functional sequelae. Clinicians must not only focus on the clinical follow-up on neurological sequelae but must also be aware of the surgical morbidity and mortality.

LG10: MRI – BASED VOLUMETRY OF THE ANAL SPHINCTER COMPLEX - PRELIMINARY DATA IN HEALTHY NEWBORNS AND INFANTS

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The anal sphincter complex (ASC) plays a key-role in continence ability, especially for patients with anorectal malfomations (ARM).

This study aimed to quantify the ASC by manual segmentation of T2 weightet MR images to receive normal values of the ASC volume. 34 infants aged 6 months or younger known to have a healthy pelvic floor who underwent MRI for other reasons were retrospectively included.

The mean weight was 4756g and the mean ASC volume was 3.95ml. Pearson coefficient showed a correlation between ASC volume and weight (r= 0,805). Additionally regression analysis was performed to receive a formula predicting the ASC volume for a certain weight: ASC(ml)= [1.1424*weight(g) - 1285.7143]/1000.

Based on T2 weighted MR images manual segmentation of the ASC was feasible in small infants. It allowed quantification of the ASC by segmentation-based volumetry. The correlation of ASC volume and bodyweight showed the comparability of segmentation results and allowed regression analysis. Consequently it was possible to establish a new formula to imply to an expected ASC volume for a certain body weight. The formula is applicable for infants aged 6 months or younger.

We believe this established formula to be a useful tool for predicting continence potential. The results of this study will serve as a reference group for future studies in children with ARM.

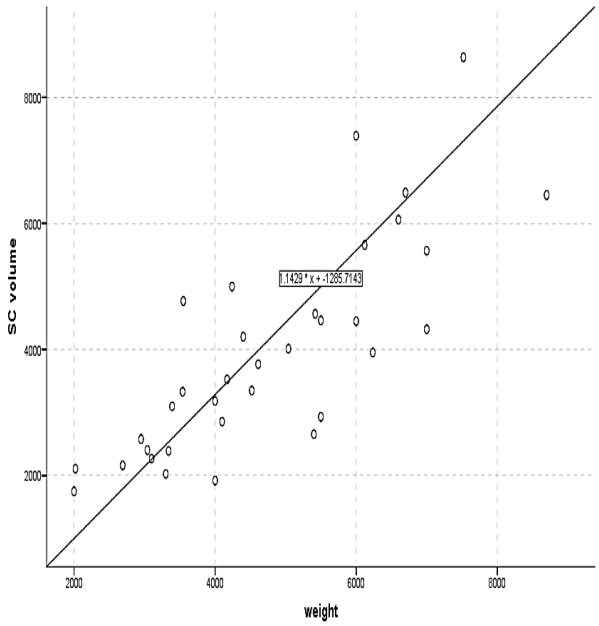

Fig 1: correlation of ASC volume and weight

LG11: OBSTETRICAL OUTCOMES IN PATIENTS WITH CLOACA

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AIM
Fifty percent of patients with cloaca present Mullerian anomalies. Recently one patient with cloacal exstrophy who were treated during infancy at our institution became pregnant. Due to this atypical case we decided to review the literature to establish if recommendations could be made to optimize the multidisciplinary management based on current evidence.

METHODS
A Pubmed literature search was undertaken to review this topic. Search terms of "cloaca," "anorectal malformation," "pregnancy," "cloacal exstrophy," "vaginal delivery," and "cesarean section" were used. We also reviewed the medical chart of the patient who became pregnant.

RESULTS
Thirteen reports that covered obstetrical outcomes in patients with cloacal anomalies were identified. Twenty-four pregnancies were reported in 16 patients. Two ectopic pregnancies, five spontaneous miscarriages, one triplet pregnancy, and sixteen singleton pregnancies were reported with a total of 19 live births (8 were preterm). Only two patients underwent vaginal delivery. None of the articles mentioned a pediatric surgeon as a part of the multidisciplinary team for decission making. Our patient had a cloacal exstrophy with terminal colostomy, Mitrofanoff, end-renal stage disease and a hemihisterectomy at 14 years old. In a multidisciplinary session a C-section was decided at 34 weeks for renal disease worsening. A pediatric surgeon was present during C-section to protect Mitrofanoff and colostomy vascular pedicles. A healthy 2,2-Kg boy was born without complications.

CONCLUSION
There is a paucity of information regarding obstetrical outcomes in adults with cloaca. We recommend proactive data collection of all such patients to document outcomes and collaboration amongst providers, including pediatric surgeons.

PW1UG01: PARENTAL PERCEPTION OF HEALTH STATUS AND QUALITY OF LIFE OF SCHOOL-AGED CHILDREN WITH ESOPHAGEAL ATRESIA

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AIM OF THE STUDY
To describe Health Status (HS) and Quality of Life (QoL) as perceived by parents of children with esophageal atresia (EA) compared to healthy controls and to evaluate the longitudinal development of the parental perception of HS and QoL.

METHODS
Within the infrastructure of a standardized follow-up program, parents of children born with EA between 1999-2013 completed proxy-reports of two questionnaires at 5, 8 and 12 years. PedsQL measures HS; possible limitations in daily life. DUX25 measures QoL; perception of daily functioning. Scores were compared (Wilcoxon signed-rank tests) with healthy controls. Change over time was assessed by Wilcoxon matched-pair signed-rank tests. Effect sizes (ES) were calculated using Cohen's *d* (0.20 small, 0.50 medium, 0.80 large). Ethical approval had been obtained.

MAIN RESULTS
We included 92 children (61% boys, 30% born prematurely, 87% Gross type C, 25% thoracoscopic repair). PedsQL scores were comparable with those of healthy controls at all ages (**Figure 1**). At 8 years, parents reported significantly lower DUX25 scores (ES=-0.43, p=0.007). PedsQL scores improved significantly from 8-12 years (n=37, ES=-0.36, p=0.008) and from 5-12 years (n=35, ES=-0.48, p=0.022) but not from 5-8 years (n=50, ES=-0.06). DUX25 scores did not change significantly over time within children.

CONCLUSIONS
Parents rated HS of children with EA as comparable to HS of healthy children. HS improved significantly over time. At 8 years, parents reported an impaired QoL. QoL did not decrease significantly over time for individual patients.

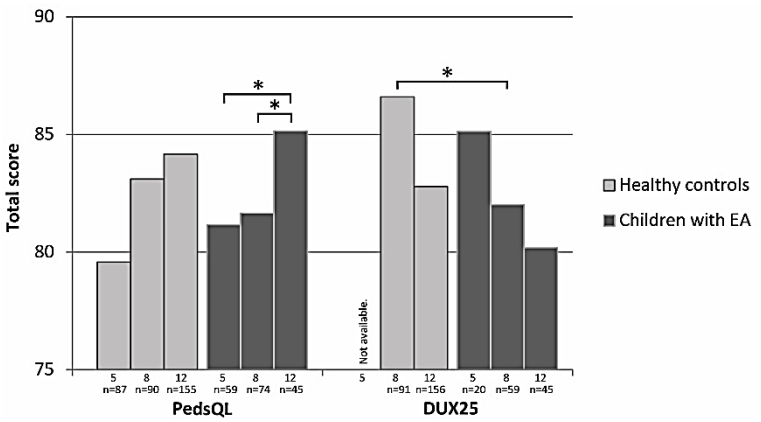

Figure 1: Total scores PedsQL and DUX25, * indicates significant difference

PW1UG02: VIDEOFLUOROSCOPIC SWALLOW STUDY IN CHILDREN WITH DYSPHAGIA

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AIM

Premature surviving patients, chronic illness, and psychological conditions are all possible causes of dysphagia in children. These complex patients require a multidisciplinary approach that includes clinical and instrumental evaluations. The videofluoroscopic swallow study (VFSS) is a well-established radiological technique largely used in adult population. VFSS in a referral center for pediatric dysphagia is herein reported.

METHODS

Dysphagic patients, aged <18 years, referred to our center underwent VFSS as part of a multidisciplinary program. Criteria for VFSS included: risk of aspiration, prior aspiration pneumonia, clinical suspicion of pharyngeal/laryngeal problem, and husky voice. VFSS started with nectar viscosity and boluses of 1-2mL. If no radiological aspiration was confirmed, patients received boluses of increased density.

RESULTS

From 2012 to 2018 288 patients, mean age 9 years (range: 2-18) underwent VFSS. In 185 cases (64%) macro inhalation was evident and patients were scheduled for gastro/digiunostomy, in 45 (16%) only micro inhalation was detected and patients referred to a rehabilitation trial, and in 58 cases (20%) no inhalation and patients sent to speech therapist. No complications occurred, although in 6 cases (0,74%) VFSS could not be completed due to demonstration of massive inhalation.

CONCLUSION

VFSS is the gold standard for identifying inhalation episodes in dysphagic patients. It allows to evaluate the characteristic of swallowing, to determine the need of nutritional devices and type of eating rehabilitation, and to monitor the progression of the underlying disease. VFSS must always be performed, even in children, before embarking on medical or surgical treatment

PW1UG03: EFFECTIVENESS AND LONG-TERM RESULTS OF OESOPHAGEAL ACHALASIA TREATMENT IN CHILDREN: A LONGITUDINAL 20-YEAR SINGLE-CENTRE COHORT STUDY

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AIM
To assess effectiveness and outcomes of paediatric oesophageal achalasia(OA) treatment.

METHODS
Longitudinal single-centre study of all children treated for OA from 1999-2018(Ethics:99.14).Data on patient demographics,presenting symptoms,treatment modalities,complications and outcomes were analysed.

RESULTS
Thirty-nine children[male;*n*=25(64.1%)] were identified[median age at diagnosis:12 years(range,1-14)].Common presenting symptoms were emesis[*n*=29(74.4%)],dysphagia[*n*=27(69.2%)] and weight loss[*n*=20(51.3%)].Median time from symptom onset to diagnosis was 8 months(range,2-24).Initial treatment was oesophageal balloon dilatation(OBD) in 29(74.4%) cases and laparoscopic Heller's myotomy(LHM) in 10(25.6%).After median follow-up of 4 years(range,0.3-10),23(59.0%) patients were symptom-free. The number of asymptomatic children was higher among those treated initially with LHM compared to OBD[8/10(80.0%)*vs.*0/29(0%);*P*<0.0001].All children who initially underwent OBD, required later repeat-OBDs[*n*=15(51.7%)] or LHM[*n*=14(48.3%)] due to persistent symptoms. Patients that had repeat-OBDs alone were less likely to achieve long-term relief compared to those treated subsequently with LHM[4/15(26.7%)*vs.*11/14(78.6%);*P*=0.0092].Of the total 24 LHM cases,1(4.2%) was converted,2(8.3%) with previous OBD suffered intraoperative mucosal perforations and 5(17.9%) required postoperatively further interventions for recurrent dysphagia:5xOBDs,3xredo-LHMs and 1xoesophagectomy+gastric transposition. Overall, children who underwent LHM had fewer total procedures compared to OBD cases[median:3(range,1-6)*vs.*6(range,3-10);*P*=0.01].

CONCLUSIONS
The majority of children treated for OA attained symptom resolution, with higher initial success rates in the LHM cohort.Long-term surveillance into adulthood is recommended due to potential symptom persistence/recurrence.

PW1UG04: CLINICAL CHARACTERISTICS AND SURGICAL OUTCOMES OF CHRONIC ENTEROPATHY ASSOCIATED WITH SLCO2A1 GENE

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AIM OF STUDY

Chronic enteropathy associated *SLCO2A1* gene (CEAS) is characterized by non-specific multiple ulcers through small intestine and differentiated with NSAIDs ulcers and Crohn disease. The number of patients is estimated about 200 people in Japan and onset is considered in pediatric period. The abnormality of *SLCO2A1* gene, which encodes a prostaglandin transporter, is also able to cause primary hypertrophic skin epithelial disorder. Surgical treatment is required in about 60% of cases due to the stricture caused from refractory recurrent ulcer. We reviewed single center experience.
Methods: Clinical symptoms, gene search results, surgical treatment and outcomes in our CEAS cases were reviewed. This study was approved by the ethical committee for clinical research of Mie University Hospital (No. 1404)

MAIN RESULTS

We experienced 6cases (Table). There were no special family records and no family marriage. Infection of Helicobacter pylori was not observed. Strictureplasty and partial resection for duodenal and intestinal lesions were performed after several conservative therapies. Improvement of clinical symptoms and growth retardation were observed in pediatric cases. There was no correlation between gene mutation of *SLCO2A1* and clinical symptoms and postoperative course.

CONCLUSIONS

In cases of anemia and growth disorder since infancy, and intractable cases of duodenal ulcer, CEAS is set as a differential disease, and active investigation of small intestine and early diagnosis by genetic testing and medical treatment are necessary. It seems possible to improve quality of life by surgical intervention such as strictureplasty or partial resection, but postoperative long-term follow is essential.

Table

case	gender	Age at onset	Age at diagnosis	Involvement	Medical therapy	Surgical procedure	Age at surgery	Present age	*SLCO2A1* mutation
1	M	4y8m	15y	DSU, MSIU	TPN, ED, PPI, PSL, IP	DG	10y	18y	c.940+1G>A / c.940+1G>A
						PR	15y		
2	F	1y	18y	MSIU, MSISU	5-ASA, IA, PSL	SP, PR	18y7m	24y	c.940+1G>A / c.664G>A
3	M	6y	10y	DSU, MSIU	PPI, IA, MPA	DSP, ISP, PR	10y	14y	c.940+1G>A/ c.1807C>T
						PR	13y		
4	M	11y	13y	DSU, MSIU	PPI, IA, MPA	DSP	13y	16y	c.940+1G>A/ c.1807C>T
5	F	4y8m	8y5m	DSU	PPI, ED, IA, MPA, BD	DSP	9y	10y	c.940+1G>A/ c.1807C>T
6	M	10y	12y9m	DU	PPI, IA, MPA			13y7m	c.940+1G>A/ c.1807C>T

M; male, F; female, y; years, m; month, DSU; duodenal stricture due to ulcer, MSIU; multiple small intestinal ulcer, MSISU; multiple small intestinal stricture due to ulcer, DU; duodenal ulcer, TPN; total parenteral nutrition, ED; enteral diet, PPI; proton pump inhibitor, PSL; predonisolone, IA; iron administration, 5-ASA; 5-amynosalicylic acid, MPA; mucosa protective agent, BD; balloon dilation, DG; distal gastrectomy, DSP; duodenal strictureplasty, PR; partial resection of intestine, ISP; intestinal strictureplasty

PW1UG05: MANAGEMENT OF ANASTOMOTIC STRICTURES AFTER ESOPHAGEAL ATRESIA REPAIR: RESULTS OF A GLOBAL SURVEY

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AIM OF THE STUDY
The ESPGHAN guideline[1] states that anastomotic dilatation is the first-line therapy in case of stricture formation after esophageal atresia (EA) repair. This study aimed to show the lack of consensus on different methods for esophageal dilatation worldwide.

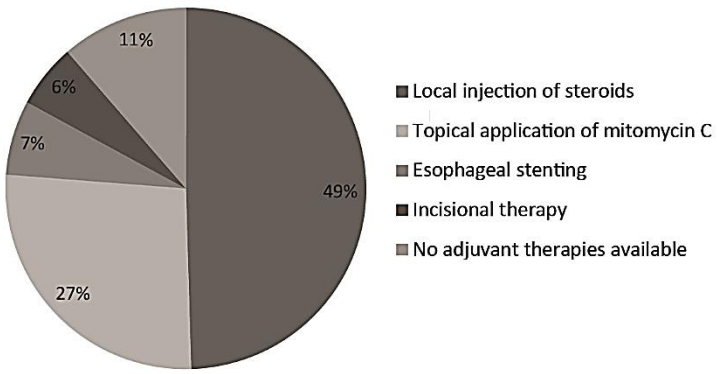
METHODS
In November 2018, an online questionnaire was sent to all ESPGHAN, NASPGHAN, INoEA and EUPSA members. Participants were pediatric surgeons, pediatric gastroenterologists or intervention radiologists experienced in treating anastomotic strictures in EA patients. Ethical approval had been obtained.

PRELIMINARY RESULTS
In January 2019, 108 professionals (38.9% non-European) had returned the questionnaire. Pediatric gastroenterologists (n=96) or pediatric surgeons (n=44) most commonly performed the endoscopies. The preferred dilatation technique was balloon dilatation (69%), with routine use of a guidewire in 62%. In 27% the balloon dilatation was radiologically guided. The balloon was insufflated with either water or natrium chloride (n=46), contrast fluid (n=42) or air (n=14). The insufflation duration was standardized in 58 centers (64%); the median duration was 60 (range 5-300) seconds. Intralesional steroids were the preferred first-line adjunctive treatment for recurrent strictures (49%) (**Figure 1**).

CONCLUSIONS
At this moment there is no consensus on the method of esophageal dilatation. Two-thirds of the participants preferred balloon dilatation. Execution (guidewire, insufflation material, insufflation duration) of this method varies. We aspire to develop a new guideline for esophageal dilatation; with a large prospective study the most effective method could be investigated.

[1] *Krishnan et al., 2016*

Figure 1: Preferred first-line adjunctive treatment (total n=105)



PW1UG06: ROUTINE ANTIREFLUX SURGERY ASSOCIATED TO GASTROSTOMY IN CHILDREN: IS IT REALLY NECESSARY? OUR SIGLE-CENTRE EXPERIENCE

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AIM OF STUDY
To study the gastroesophageal reflux (GER) in children who underwent gastrostomy in a single pediatric institution.

METHODS
Retrospective study of patients undergoing gastrostomy during the period 2000 - 2017. Review of demographic data, clinical course and complications. GER was considered positive in patients with clinical manifestations who required antisecretory or prokinetic treatment, or antireflux surgery to control symptoms.

MAIN RESULTS
We included 207 patients with a median age of 2 years [r:0,25-18]. Neurological impairment was the most frequent underlying condition (74%). Swallowing difficulty and undernourishment were the main surgical indications for gastrostomy.
Prior to gastrostomy, 96/207 patients (46%) showed GER symptoms.
Antireflux technique and gastrostomy were performed at the same time in 41/96 (43%) of patients with preexisting GER. Six of these showed GER worsening (4 of them required a redo-Nissen technique). We registered 2 gastric perforations and 2 sustained Dumping syndromes as complications in this group.
55/96 (57%) of patients with preexisting GER underwent gastrostomy alone. Clinical manifestations disappeared in 16/55 (29%), and improved or stabilized in 19/55 (35%). GER worsening occurred in 20/55 patients (36%). Antireflux surgery was indicated in 10 cases.
In patients with no previous clinical manifestations (111/207), GER symptoms appeared after gastrostomy in only 18/111 (16%) and 2 cases required antireflux surgery.

CONCLUSIONS
In our experience, routine antireflux surgery at the time of gastrostomy placement is not justified, due to the GER improvement o stabilization in most cases. The indication should be individualized for each patient.

PW1UG07: ORAL ADMINISTRATION OF ATROPINE SULFATE IN THE TREATMENT OF INFANTILE HYPERTROPHIC PYLORIC STENOSIS

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AIM
The study evaluates the impact of different oral administration regimens of atropine on its efficacy in treating infantile hypertrophic pyloric stenosis (IHPS).

METHOD
The study included 100 patients treated from 2006-2016. Fifty-five percent of them were operated immediately after diagnosis was set. The remaining 45% of patients were divided into two subgroups depending on the regimen of orally administered atropine. The efficiency of conservative treatment in subgroups was analyzed. Potential predictive factors of the negative outcome were defined by descriptive statistical methods, non-parametric tests and multivariate analysis.

RESULTS
Fifteen patients (33%) from Ia subgroup were treated with progressively increasing dose and 30 patients (67%) from Ib subgroup with high initial dose (p= 0.07). Thirty-six (80%, p=0.0008) out of 45 patients were successfully treated by oral administration of atropine and discharged without surgery. They received high initial doses more frequently than progressive ones (28 vs. 8, p = 0.003) and experienced less frequent: hypochloremic alkalosis (HCA) (2/36 vs. 4/9, p=0.010), gastric aspirations (15/36 vs. 9/9, p=0.002) and <5 episodes of vomiting in 3 days (34/36 vs. 4/9, p=0.002) than operated patients.
Multivariate analysis revealed that patients who received progressively increasing dose of atropine were at 18 times greater risk of surgery (OR,95%,Cl; 17.9, p=0,033), who had HCA were at 15 times (OR,95%,Cl; 15.06, p=0.084) and who experienced vomiting >5/3 days were at 9 times greater risk of surgery (OR,95%,Cl; 9.45, p=0.059).

CONCLUSION
Conservative treatment of IHPS is a valid alternative to piloromyotomy, especially in cases with contraindications for general anesthesia.

PW1UG08: DUODENAL DUPLICATIONS: CLINICAL CHARACTERISTICS, TREATMENT AND OUTCOME

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AIM OF THE STUDY
The aim of this study was to analyse different clinical aspects, treatment and outcome of duodenal duplications.

METHODS
A retrospective single center study of 13 patients who were operated on between 1994 – 2018 because of duodenal duplication. The age of the children at the time of diagnosis, the sex, prenatal diagnosis, clinical signs, the type of surgical intervention and long-term outcome were studied.

MAIN RESULTS
13 patients (6 girls and 7 boys) who presented with intraoperative or histological findings of duodenal duplication were identified, 7 of them were prenatally diagnosed. Their ages ranged from 1 day to 60 months. The average age at the time of operation was 30.6 months. 12 children were symptomatic: intermitent vomiting with an admixture of bile (9 cases), high intestinal obstruction (2 cases), digestive bleeding (1 case). 1 case was completely asymptomatic (prenatal detection). Additionally we found a big belly in 4 cases, in 2 of them ascites. Duodenal duplication was located in the D2 region in 10 patients, in D3 in 2 patients, in D1 in 1 patient. All cases except one were non communicating types. 9 complete resections (one with reimplantation of biliar and pancreatic ducts), 3 intraduodenal derivations and 1 duodenojejunoanastomosis were performed. The outcome was uneventful in all cases with an average follow-up of 8 years.

CONCLUSIONS
Duodenal duplications are rare malformations in children with the assumption of good prognosis. Complete surgical resection is the preferred treatment, although partial excision with intraduodenal derivation does not worsen the outcome.

PW1UG09: INTRALESIONAL STEROID INJECTIONS AS TREATMENT FOR STRICTURES AFTER ESOPHAGEAL ATRESIA REPAIR: IS GROWTH AFFECTED?

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AIM OF THE STUDY
The initial treatment for anastomotic stricture (AS) formation after esophageal atresia (EA) repair is endoscopic dilatation. In case of recurrent strictures, a possible adjuvant treatment is intralesional steroid injection (ISI, ESPGHAN guideline 2016). We aimed to evaluate the effect on stricture recurrence and the possible side effects of injecting steroids.

METHODS
The records were reviewed of all children born with EA between 2014-2017 and treated with ISI (40 mg triamcinolone acetide). Data was collected on primary surgery, previous stricture treatment, postoperative complications (including clinical symptoms of adrenal suppression) and outcome (recurrence and change in 12-months growth parameters after the injection). SD scores were calculated, corrected for prematurity. Analysis was by descriptive statistics and mixed model analysis. Ethical approval had been obtained.

MAIN RESULTS
We included six out of 60 EA patients born in this period (median gestational age 39.2 (range 31.9-41.1) weeks, median birth weight 2865 (1275-3750) grams). Median age at time of injection was 12.4 (2.1-34.7) months. Steroids were injected after median 6 (2-20) dilatations. In five patients the stenosis did not recur. No postoperative complications were reported, especially no adrenal suppression symptoms. A significant positive change in trend for weight (r=0.70, p=0.003) was calculated, versus a negative change for height (r=-0.87, p=0.003).

CONCLUSIONS
ISI seems an effective adjuvant treatment for recurrent AS in EA children although it remains important to monitor growth effects. However, the level of evidence is still low. Therefore, we recently started a randomized controlled trial to further evaluate this treatment.

PW1UG10: ACHALASIA AND ALLGROVE SYNDROME TWENTY SIX YEAR EXPERIENCE

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AIM OF THE STUDY
Achalasia is a primary functionnal motor disorder of the lower esophageal sphincter. It is an extrermely rare disorder in children. It can be treated effectively in most patients by pneumatic dilation, Heller esophagomyotomy, and peroral endoscopic myotomy.

METHODS
We report 40 cases of achalasia operated in the department of pediatric surgery during 26 years.

RESULTS
Forty patients were included. We diagnosed 30 Allgrove syndrome associating achalasia, alacrimia and Addison's disease. Main symptoms were vomiting (70%), dysphagia (60%) and weight loss in all cases. Preoperative investigations included an oesophagram showing an oesophageal dilation and bird beck sign in all cases. Oesophageal manometry was also performed in all cases showing increased low oesophageal sphincter pressures. Heller cardiomyotomy associated to a concomitant fundoplication were realized in all cases. Immediate postoperative evolution was event free. Recurrent postoperative dysphagia was noted in 8 patients among those diagnosed with Allgrove syndrome. An endoscopic dilation was then performed in 7 cases and oral nifedipine was prescribed in 1 case. Postoperative reflux was reported in 10% of cases. No digestive symptoms were observed in the group of idiopathic achalasia.

CONCLUSION
In accordance with previous published studies, our results show that Heller cardiomyotomy has proved its efficiency and reliability in the treatment of idiopathic achalasia. However, we believe that postoperative reccurency in Allgrove syndrome is imputed to the progressive and neurodegenerative nature of the disease. New therapies should aim to stop the disease at early stages.

PW1UG11: OMENTAL HERNIATION: AN UNDERESTIMATED COMPLICATION OF LAPAROSCOPIC PYLOROMYOTOMY

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AIM
Pyloromyotomy is a common surgical procedure in infants and can be performed with a small laparotomy or laparoscopically. So far, no specific complications have been documented about one of the approaches. There is a small number of case reports about omental herniation (OH), a complication of the laparoscopic approach, however its incidences and consequences are unknown. The objective of this study is to examine and compare the complications of open and laparoscopic pyloromyotomy with specific attention to OH.

METHODS
Data were analyzed retrospectively of all patients with hypertrophic pyloric stenosis who underwent pyloromyotomy at two pediatric surgical centers between January 2007 and December 2017. Severity of complications was classified by Clavien-Dindo.

RESULTS
We included 474 infants (236 open; 238 laparoscopic). 401 were male (85%) and the median (IQR) age was 33 (19) days. There were 83 surgical complications in 71 patients (15.0%). In the open group 45 infants (19.1%) experienced a complication vs. 26 infants in the laparoscopic group (10.5%)(p=0.013). Severity and quantity of postoperative complications were comparable between both groups (Clavien-Dindo grade I-IIIb)(open N=26; laparoscopic N=22)(p=0.522). Serosal lesions of the stomach and fascial dehiscence occurred only after the open approach (N=19, p<0.001 and N= 8, p=0.004 respectively). OH occurred only after laparoscopy (N=6, p=0.03) and required re-intervention in all cases.

CONCLUSIONS
The surgical complication rate of pyloromyotomy was 15.0%. Serosal lesions of the stomach and fascial dehiscence are only present after open pyloromyotomy and OH after laparoscopy. The latter complication is underestimated and requires attention.

PW1UG12: EFFECTIVENESS OF LAPAROSCOPIC SLEEVE GASTRECTOMY FOR GENETICALLY DETERMINED OBESITY IN PEDIATRIC PATIENTS

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AIM OF THE STUDY
Prader-Willi (PWS) and Bardet-Biedle syndrome (BBS) are the most frequent genetic causes of secondary obesity in pediatric age due to compulsive hyperphagia and leading to severe co-morbidities. The aim of this study is to assess the effectiveness and safety of Laparoscopic Sleeve Gastrectomy (LSG) in children with secondary obesity.

METHODS
Thirteen patients (8 male, 5 female, 1 affected by BBS, 12 PWS) with a mean age of 15.3 years (range 8-21) were included.

MAIN RESULTS
Mean follow-up was 36 months (range 8-70). Mean pre-op weight was 106.25 ± 25.6, mean pre-op BMI was 44.4 ± 3.3. One year after the procedure, total mean weight decreased to 92 ± 27 Kg ($p< 0.05$) while total mean BMI was 38 ± 8 ($p <0.05$). After a mean follow-up of 36 months, total mean weight reached 97 ± 27 Kg ($p> 0.05$), total mean BMI was 40.5 ($p>0.05$). Six out of 13 (46%) maintained their weight loss.

CONCLUSIONS
LSG seems to be effective in about the 50% of cases. We observed a weight regain starting during the second year after the procedure up to 36 months of follow up in 7/13 patients (53%), but no patient returns to the preop weight. Age of treatment, degree of mental retardation and family/caregivers collaboration are the most important factors conditioning long-term results.

PW2LG01: CO-INJECTION OF HUVEC AND MESOANGIOBLASTS IN IN DECELLULARISED INTESTINE ALLOWED FROMATION OF AN ORGANISED VASCULATURE

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AIM
To engineera functionally lumenalised endothelium to obtained a complete perfusion of engineered symptoms.

METHOD
We have co-injected endothelial cells (Human Umbilical Vein Endothelial Cells, HUVECs) and pericyte (Mesoangioblasts, MABs) through the superior mesenteric artery of an acellular rat intestine. Both in vitro bioreactors and in vivo models were used to evaluate cellular engraftment and differentiation.
Results:

HUVEC and MABs seeded into the vasculature of the acellular intestinal scaffold engrafted in an organised fashion resemblying normal intestinal vasculature. On the opposite, HUVECs alone failed to form a functional and mature endothelium. MABs differentiated both on pericytes and on smooth muscle cells. Results obtained in the bioreactor were confirmed in-vivo with HUVEC and MABs helping graft survival when compared to the ones receiving only HUVEC.

CONCLUSION
Decellularised intestines receiving HUVEC and MABs formed stable vessels optimising graft survival in vivo when comparing to the ones receiving only HUVEC.

PW2LG02: EARLY STOMA CLOSURE AFTER NECROTIZING ENTEROCOLITIS IS AS SAFE AS LATE CLOSURE

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INTRODUCTION
A number of neonates with Necrotizing Enterocolitis (NEC) need a temporary intestinal diversion. The timing of stoma closure (SC) remains controversial. The aim of this study is to compare the outcomes between early and late closure in these patients.

METHODS
Retrospective review of all neonates with NEC or intestinal perforation who underwent an enterostomy procedure (EP) followed by SC between 2001 and 2016. Subjects were divided in 2 groups, according to the time of SC: early SC (in the first 8 weeks after EP) or late SC (after 8 weeks). Baseline characteristics, surgical outcomes, complications, type and duration of life support therapies and total days on parenteral nutrition (PN) were recorded for comparison between groups.

RESULTS
Eighty-four patients were included in the review, 76 of whom were preterm. Mean gestational age was 29.33±0.4 weeks. Mean weight at surgery was 1311±79.8 g (550-4600). Thirty patients (36.5%) underwent early SC and 54 (63.5%) late SC. No differences between groups were observed in the need for hemodynamic support (10% vs 12%; p >0.05), duration of ventilatory support (7.73 vs 0.63 days; p> 0.05) and the number of days on PN (16.68 vs 13.18; p>0.05). Complications were found in 33% patients with early SC and 28% patients with late SC (p>0.5). No differences in mortality rates were found (3% vs 1%; p>0,05).
CONCLUSIONS
Early SC seemed to be as safe as late SC in neonates who needed an EP due to NEC or intestinal perforation.

PW2LG03: PRENATAL IMAGING DIAGNOSIS IN HIRSCHSPRUNG'S DISEASE: JUST AN ILLUSION?

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AIM OF THE STUDY

The study aimed to define prenatal signs of Hirschsprung's disease (HD), the most common cause of neonatal bowel obstruction.

METHODS

In this multicenter study, a reference sonographer read retrospectively the antenatal ultrasounds of patients with HD born between 2012 and 2017. Information collected included nuchal translucency, presence of intra-uterine growth retardation, increase in the abdominal perimeter above the 95th percentile in the third trimester, presence of dilated digestive loops and hyperechoic bowel, and any other morphological abnormality. The Ethical Review Board of our institution approved the study.

MAIN RESULTS

Thirty-six patients were included, 7 with a rectal form, 24 with a rectosigmoid form, and 5 with a total colonic form. The median gestational age at birth was 39.1 weeks. No dilated digestive loops or hyperechoic bowel were found. An abdominal perimeter above the 95th percentile in the third trimester was present in 7 patients (19.4%) (p=0.003), all had either a rectal or a rectosigmoid HD. Clinical presentation was a delayed meconial emission after 48 hours of life in 22 neonates (61.1%), between 24 and 48 hours of life in 8 (22.2%) and in the first 24 hours of life in 6 (16.7%).

CONCLUSIONS

We highlighted the fact that the increase in the abdominal perimeter above the 95th percentile in the third trimester may be a warning sign and needs to be studied in a larger population. An optimization of the early diagnosis on a delay in the meconial emission must be reinforced.

PW2LG04: SHORT -TERM COMPLICATIONS AFTER TRANSANAL ENDORECTAL PULL-THROUGH PROCEDURE FOR HIRSCHSPRUNG'S DISEASE USING THE CLAVIEN-DINDO GRADING SYSTEM

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Aim of the study
Hirschsprung's disease (HSCR) is a developmental defect of the enteric nervous system. Transanal endorectal pull-through (TERPT) is one of the most common surgical procedures for HSCR. Short-term complications have been reported to be uncommon after TERPT, but complication have not been objectively described according to any classification system. Clavien-Dindo is an objective classification system, used world-wide, to describe postoperative complications. The aim of this study was to use Clavien-Dindo for classification of short-term complication after TERPT.

Methods
This was a cross-sectional observational study including all 75 individuals, with biopsy-verified HSCR, managed with TERPT at our institution between 2006 and 2018. Data on the surgical procedure as well as short-term complications were retrieved from the medical records. The main outcome was postoperative complications classified according to Clavien-Dindo.

Main results
Eighteen (24%) of the 75 patients (55 males) had a short-term postoperative complication classified according to Clavien-Dindo. The complications were grade 1 in 10 patients, grade 2 in 5 patients, and grade 3b in 3 patients. Three female patients had a complication, compared to 15 of the male patients, p=0.366. We identified preoperative stoma as a risk factor for developing a Clavien-Dindo classified complication Odds Ratio 4.55 (Confidence Interval 95% 1.32-16.07).

Conclusions
It is important to describe postoperative complications in a structured way in order to compare studies. Post-operative complications, according to Clavien-Dindo, occurred in 24 % of the patients after TERPT.The majority of complications were mild and more serious complications occurred in 4% of the patients.

PW2LG05: TRAINING OF THE STEPS OF AN POSTERIOR SAGITTAL ANORECTOPLASTY IS FEASIBLE ON A LOW BUDGET MODEL

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AIM

An Anorectal Malformation (ARM) is a rare congenital malformation, which requires proper correction to ensure the best long-term prognosis. The posterior sagittal anorectoplasty (PSARP) is the preferred procedure for an ARM, which consists of several component steps to reconstruct the recto-perineal complex. This is a relatively infrequent and complex procedure, in which a structured approach is important. Therefore, training on an affordable model could be beneficial.

METHOD

A low-cost three-dimensional ARM model with recto-perineal fistula was developed. The base was reusable and the perineal body disposable. Both expert pediatric surgeons (Experts) and residents/fellows (Target group) were recruited for this study. They completed a questionnaire regarding their demographics and experience, following they rated the realism and didactic value of the model, using a 5-point Likert scale (1: very bad, 3: neutral, 5: very good).

Results

In total 44 participants were recruited during the 11th European Pediatric Colorectal Congress 2018 (Target group n=20, Experts n=24). The model has high mean scores of 3.8-4.4 for the total group and even higher on several aspects by the Target group (Table). The experts regarded the haptics and manipulation of the fistula less realistic than the Target group (3.7 versus 4.3, p=0.021 and 4.2 versus 4.6, p=0.047). It was considered to be a very good training tool (mean 4.3), without significant differences between the groups.

CONCLUSION

These results show general consensus, by both experts and the target group, that this model is a potent training tool for the component steps of a PSARP.

Opinion on PSARP-model *Values are mean (SD)*	**Total group n=44**	**Target group n=20**	**Expert group n=24**	**p-value**
Visual aspects	4.3 (0.55)	4.4 (0.50)	4.2 (0.59)	0.250
Haptics of perineal region	3.9 (0.91)	4.0 (0.89)	3.8 (0.93)	0.568
Haptics of fistula	3.9 (0.87)	4.3 (0.64)	3.7 (0.96)	**0.021**
Step 1: Placing sutures around fistula	4.3 (0.65)	4.6 (0.61)	4.2 (0.64)	**0.047**
Step 2: Sagittal opening in midline	4.3 (0.77)	4.6 (0.60)	4.0 (0.81)	**0.012**
Step 3: Dissection fistula/ rectum	3.8 (1.10)	3.9 (1.25)	3.8 (0.98)	0.755
Step 4: Building the sphincter complex	4.1 (0.87)	4.0 (1.02)	4.1 (0.73)	0.754
Step 5: Anoplasty	4.4 (0.69)	4.6 (0.60)	4.2 (0.72)	**0.040**
Training tool for component steps of PSARP	4.3 (0.64)	4.5 (0.61)	4.2 (0.65)	0.097

PW2LG06: ADULTS BORN WITH ANORECTAL MALFORMATIONS CALL FOR STRUCTURED INFORMATION AND IMPROVED TRANSITIONAL CARE A FOCUS GROUP STUDY FROM TWO COUNTRIES

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AIM OF THE STUDY
To explore life experiences among adults born with anorectal malformations (ARM) and their needs and expectations of the healthcare system.

METHODS
Two paediatric surgical centres in two countries conducted gender divided focus group discussions regarding adult patients' needs and expectations of the healthcare system including their views of future healthcare structures. Discussions were analysed by qualitative content analysis. Ethical approval was obtained.

MAIN RESULTS
Sixteen participants (ten women) with a median age of 24 (19-47) years, born with diverse types of ARM were included in four focus groups. The following categories concerning the participants' experiences, needs and expectations of the healthcare system emerged:

1.Improvement of patients' and healthcare professionals' knowledge about ARM by
a) Informing and educating patients
b) Facilitating formation of patient support groups and patient to patient mentorships
c)Increasing adult care professionals' specific knowledge of ARM

2.Support regarding physical and/or psychological aspects of
a) Bowel function
b) Sexual function and intimate relationships
c)Fertility
d)Postoperative scars
e) Relationships with friends, employers and colleagues
f) Bullying

3.Referral to adult pelvic floor centres ensuring transitional care and
a) Promoting exchange of knowledge and clinical experience between paediatric- and adult care professionals
b) Facilitating patients' contact with healthcare professionals

CONCLUSIONS
Adults born with ARM call for structured information and improved transitional care. The results give suggestions of clinical implications regarding future healthcare structures as well as future research questions.

PW2LG07: MECKEL'S DIVERTICULUM AND CROHN'S DISEASE – HAND IN HAND

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AIM OF THE STUDY
To refer the incidence of Meckel's diverticulum (MD) in a group of children operated on for Crohn's disease (CD) and compare with a group of children who underwent diagnostic laparoscopy (DL) for chronic abdominal pain.

METHODS
Retrospective comparative cohort study of patients with CD who underwent abdominal operation and patients who underwent DL between 2008 - 2018.

MAIN RESULTS
There were 100 CD patients and 184 DL patients during the study period. MD was found in 9 CD patients (9%; 7 boys, 2 girls) and in 2 DL girls (1%). Median age of CD patients at the time of operation was 16.4 years and MD was located 30 to 80 cm (mean 44 cm) proximal to the ileocecal valve and was 1.5 to 4.0 cm (mean 2.3 cm) long.Diverticulectomy in 3, partial ileal resection in 4 and ileocaecal resection including MD in 2 was performed. No postoperative complications occurred. No heterotopic mucosa was found on histopathology but in 3 cases chronic mucosal inflammation was described within MD in patients with CD. All MD were incidental findings. Two DL patients had MD 4 and 5 cm long, without heterotopic mucosa or inflammatory infiltration.

CONCLUSION
Our study shows that MD is significantly ($p<0,001$) more common in patients with CD. We suggest that causes for this could have a genetic background and we plan further genetic analysis of our patients. Due to the inflammatory changes within the MD we recommend its resection in CD patients.

PW2LG08: HIGH RESOLUTION ANORECTAL MANOMETRY IN HEALTHY INFANTS

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AIM
Hirschsprungs disease (HD) is a congenital potentially life-threatening disease. Anorectal manometry identifying the presence of a rectoanal inhibitory reflex (RAIR) excludes HD. Conventional anorectal manometry has been used for decades but recently high resolution anorectal manometry (HRAM) has become more widely used. Normative data from healthy infants is lacking though. The purpose of this study was to evaluate HRAM in healthy term babies to get normative data. The study has ethical approval.

METHOD
120 healthy babies were included in this prospective study. Until now 195 HRAM has been done, 103 at 2 and 92 at 6 months of age. HRAM was performed with a thin, soft customized 9 Charrières catheter. Resting pressure was measured when the baby was calm. The balloon was filled with 3 ml. If a RAIR was not elicited, volume was increased stepwise with 3 ml until RAIR was present.

MAIN RESULTS
All children had a normal RAIR in at least one investigation at 2 or 6 months. At 2 months of age RAIR was found in 94%. Volume needed to elicit RAIR was median 9 ml (range 3-18 ml). Resting pressure was mean 65 cmH2O(range 37-93). At 6 months RAIR was found in 85%. Volume needed to elicit RAIR was median 6 ml(range 3-21). Resting pressure was mean 71 cmH2O(range 54-102).

CONCLUSION
HRAM is a safe, gentle and applicable method. This study has provided normative data from healthy children. The method is now in use in our clinic.

PW2LG09: COLORECTAL POLYPS IN CHILDREN

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AIM OF THE STUDY
Colorectal polyps (CRP) are one of the causes of rectal bleeding in children. This article aims to present clinical experience for CRP.

METHODS
Patients diagnosed with CRP between January 2001 and July 2018 were evaluated retrospectively.

MAIN RESULTS
There were 95 patients, 58 male and 37 female. The median age was 6 (2 months-15 years) years. 88 patients admitted with rectal bleeding, 6 with mass arising from anus and one with rectal prolapse. Endoscopic evaluation was performed in 41 (43%) patients. Four of them underwent rectoscopy, 20 rectosigmoidoscopy and 17 total colonoscopy. Eleven patients (12%) had polyps which localized proximally that could not be reached by rectal route; 10 were removed endoscopically. The transverse colonic polyp in a patient could not be excised colonoscopically due to broad base and it removed by colotomy. In 54 patients (57%) who had palpabl polyps, excision was performed without endoscopy. In 2 patients who underwent endoscopic polypectomy, polyps were left in lumen. In the remaining 93 patients, 58 juvenile, 11 inflammatory, 10 hyperplastic, 9 adenomatous, 2 pseudopolyp, 1 hamartomatous, 1 hemangiomatous and 1 inflammatory fibroid polyp were detected in pathological examination. Four of the adenomatous and 2 of the juvenile polyps had low grade dysplasia. None of the patients required secondary surgery.

CONCLUSIONS
Colorectal polyps in children are benign usually. However, adenomatous polyps that can be premaligned. Although polyps can be removed by rectal route frequently, colonoscopy is recommended for all children when considering possible premalignant conditions.

PW2LG10: QUALITY OF LIFE AND NEUROPSYCHOLOGICAL DEVELOPMENT AT SCHOOL AGE IN HIRSCHSPRUNG'S DISEASE

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AIM OF THE STUDY
To determine the quality of life and neuropsychological development of school-aged children with Hirschsprung's disease.

METHODS
In this observational monocentric study, a multidisciplinary team prospectively assessed quality of life, neuropsychometric development and functional digestive outcomes. This study was approved by local ethical committee and registered on ClinicalTrial.gov (NCT03406741). Kidscreen and VSP-A questionnaires assessed the quality of life and were compared to the reference population (Eurostat database). Intelligence, attention and executive functions, perceptual organisation and memory were evaluated using the Wechsler Children's Intelligence Scale, the NEuroPSYchological assessment, and the Rey figure test. Functional digestive outcomes were obtained using the Krickenbeck score.

MAIN RESULTS
Fifteen patients were included, with a mean age of 10.25 years. The children's Kidscreen-assessed quality of life index was higher than the reference population (p=0.01). The Full-Scale Intelligent Quotient was dissociated in 64% of children. The Perceptional Reasoning Index and the Processing Speed Index were observed at lower levels. There were no disturbances in executive functions. A satisfactory functional digestive outcome was noted in 46.7% of children.

CONCLUSIONS
Children with Hirschsprung's disease have been shown to have subtle decreased performances in some areas of intelligence. Performing a neuropsychological assessment upon entering elementary school could help to detect these specific learning disabilities.

PW2LG11: CHANGES IN ANTIBIOTIC REGIMEN OF APPENDICITIS PATIENTS IN A SINGLE INSTITUTION

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AIM OF THE STUDY
Modern antibiotic protocols of acute appendicitis suggest preoperative prophylaxis with broad-spectrum agents and intravenous therapy in complicated cases. Our aim was to compare the changes in the antibiotic regimen of both uncomplicated (UCA) and complicated appendicitis (CA) cases in a single university center.

METHODS
In a retrospective cohort study after ethical board approval we assessed all acute appendectomy cases in the year 2009, 2013 and 2018. We analyzed UCA and CA antibiotic usage, the personal pattern of antibiotic usage and complications in the postoperative 30 days.

RESULTS
Study population included 211 patients (61/2009, 62/2013, 88/2018), the number of UCA was 149. 5.4% of the UCA patients recieved less than 24 hours prophylaxis in 2009 (2/37), this ratio was 30.2% in 2013 (13/43) and increased to 68.1% in 2018 (47/69). Regarding CA patients, triple combination was used in 58.3% in 2009 (14/24), in 26.3% in 2013 (5/19), and in 0% in 2018 (0/19). Broad spectral monotherapy was administered in 8.3% of CA patients in 2009; this ratio was 15.7% in 2013, and 63.15% in 2018. Complication rate of UCA patients was 8.1% in 2009, 2.3% in 2013, 4.3% in 2018; and it was 25% (2009), 0% (2013) and 5.2% (2018) regarding CA patients. In 2009 only 1 of the consultants used „modern" antibiotic policy; this number increased to 3 in 2013 and to 4 of the 5 consultants in 2018.

CONCLUSIONS
Introduction of modern antibiotic policy is achievable and it has no negative effect to outcome.

PW2LG12: DELAYED DIAGNOSIS OF ANORECTAL MALFORMATIONS: A PLEA FOR STANDARDIZED NEONATAL ANORECTAL EXAMINATION

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BACKGROUND
Anorectal malformation (ARM) includes a wide spectrum of different anomalies. Delayed diagnosis of the ARM type may lead to significant morbidity. We aim to analyze delayed or mismanaged cases of ARM referred to a single referral hospital and explore reasons of mismanagement.

METHODOLOGY
A retrospective review was conducted of patients with delayed presentation of ARM from March 2009 to September 2018. Delayed presentation was defined as patients not diagnosed with ARM in the first 48 hours of life or diagnosed with the incorrect ARM type. Basic demographic data were collected as well as initial and final diagnoes and management.

RESULTS
13 patients were analyzed: 10 (76.9%) were male, 4 (30.8%) had minor associated anomalies. All patients had perineal fistula, however, incorrect diagnosis included 5 (38.5%) as normal anus, 3 (23.1%) as recto-urinary fistula, 3 (23.1%) as anal stenosis, and 2 (15.4%) as anterior anus. Patients' presentation to our hospital was due to severe constipation 7 (53.8%), suspicion of abnormal anus 2 (15.4%), or intestinal obstruction 1 (7.7%). All patients underwent posterior sagittal anorectoplasty (PSARP). Reasons of mismanagement included incorrect diagnosis by a pediatric surgeon 6 (46.2%), a pediatrician 4 (30.8%), or family socio-economic reasons 3 (23.1%).

CONCLUSION
Delayed recognition of ARM often leads to significant morbidity to the patients. Surprisingly, pediatric surgeons are responsible for incorrect identification for most of our patients followed by pediatricians. Therefore, more effort should be made to standardize neonatal anorectal examination for the training doctors in pediatrics and pediatric surgery

PW3TH01: ARE THE MEASUREMENTS EFFECTED IN CONGENITAL DIAPHRAGMATIC HERNIA PATIENTS BY FETAL GROWTH RESTRICTION?

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AIM OF THE STUDY
Intrauterine growth restriction (IUGR) is the failure of a fetus to reach its growth potential. The causes of IUGR might be maternal or placental. Herein, we aim to find if the measurements obtained for evaluation of pulmonary development in congenital diaphragmatic hernia (CDH) are affected by IUGR.

METHODS
A retrospective chart review (IRB#2017-6361) was performed on all prenatally diagnosed CDH patients between 2007-2016. Data collected was focused on patient demographics, fetal and neonatal anthropometric measurements, and fetal lung parameters. Fetal growth was assessed by curves based on US data by Olsen et al. and Peleg et al.

MAIN RESULTS
Of 147 CDH patients, 48(30%) patients showed associated IUGR, being 20 patients diagnosed in the fetal period and 28 postnatally. The positive predictive value of prenatal calculations for IUGR was 90% (95% CI 68.9-97.3), while the negative predictive value was 92.1% (95% CI 87.7-95.1). The sensitivity of prenatal imaging to detect IUGR was 64.3% (95% CI 44.1-81.4) and the specificity was 98.3% (95% CI 94.1-99.8). LHR and O/E LHR values were lower in IUGR patients which, however, did not reach statistical significance. On the other hand, there were more patients in IUGR group where the O/E LHR ratio was less than 25%.

CONCLUSIONS
Although prenatal ultrasound lung measurements in CDH/IUGR patients are lower than the non-restricted ones, statistical significance could not be proved. These facts and use of fetal MRI-volumetry should be considered in prenatal categorization of CDH severity and parental counseling.

PW3TH02: FACE AND CONTENT VALIDITY OF LOW BUDGET NEONATAL THORACOSCOPIC SURGERY MODELS

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AIM

Minimally invasive surgery is used more often for the correction of congenital malformations, including congenital diaphragmatic hernia (CDH) and esophageal atresia (EA). Because these conditions are rare, these techniques are not used often. However, it is important to master these difficult skills, to avoid complications. The aim was to validate recently developed, readily available, low-cost models to train these procedures outside the clinical setting.

METHOD

Two models for CDH and EA were validated during several pediatric surgical conferences (January 2017-December 2018), used in either the LaparoscopyBoxx or EoSim simulator. The participants were asked to use both models and complete questionnaires regarding their opinion on realism (face validity) and didactic value (content validity). They were considered valid, if they were significantly higher than neutral (neutral=3 on the 5-point Likert score).

RESULTS

The EA model was evaluated by 32 participants, of which twelve experienced pediatric MIS surgeons. The remainder were the target group, consisting of pediatric surgeons, fellows and residents. There were no significant differences in opinion between the groups. The CDH model was evaluated by 36 participants, of which fifteen experts, without significant differences in the opinions.
The Table shows the results of the mean opinion of the participants. All items scored significantly higher than neutral for both models (p<0.001), except for the haptics of the simulated diaphragm (mean 3.3, p=0.054). Both models were considered a good training tool (means 3.9).

CONCLUSION

These easily available and very low budget models are considered valid by both experts and target group participants.

Low budget MIS models *(Values are in mean and SD, p-value are compared to a neutral opinion)*	**Congenital Diaphragmatic Hernia N=36**	**p-value**	**Esophageal Atresie N=32**	**p-value**
Visual aspects	3.7 (0.70)	<0.001	4.0 (0.80)	<0.001
Haptics of the simulated diaphragm/ esophagus	3.3 (0.92)	0.054	3.7 (0.90)	<0.001
Grabbing of the tissue	3.5 (0.77)	<0.001	3.8 (0.92)	<0.001
Defect size of the hernia	3.9 (0.71)	<0.001		
Opening of the pouch			3.8 (0.83)	<0.001
Placing sutures to close the diaphragm defect	3.8 (0.71)	<0.001		
Placing sutures for the anastomosis			3.9 (0.81)	<0.001
Tension on the sutures	3.8 (0.75)	<0.001	4.1 (0.93)	<0.001
Training tool for the thoracoscopic closure of a diaphragmatic hernia	3.9 (0.64)	<0.001	3.9 (0.86)	<0.001

PW3TH03: IMPECT TRIAL: INTERVENTIONS WITH MUSIC IN PECTUS EXCAVATUM TREATMENT

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AIM OF THE STUDY
All Pectus Excavatum (PE) repairs are associated with substantial postoperative pain, despite the use of epidural anesthesia. There is a growing interest in finding ways to alleviate postoperative pain following these procedures, such as musical interventions. Perioperative musical interventions have shown to alleviate pain and anxiety in adults significantly, but still lack sufficient scientific evidence in children and adolescents. To evaluate the effects of musical interventions on postoperative pain in children and adolescents, a clinical trial was designed.

METHODS
A prospective multicenter randomized controlled trial comparing perioperative recorded musical interventions in addition to standard care with standard care only during the Nuss-procedure correcting PE was set up. 170 children and adolescents (12-18 year of age) will be included in three participating centers in the Netherlands. Patient inclusion started in November 2018, and is still ongoing. The primary outcome is pain (Visual Analogue Scale). Our secondary outcomes are anxiety, use of analgesics, quality of life, length of hospital stay and vital parameters.

MAIN RESULTS
A recent small meta-analysis suggested a positive effect of perioperative musical interventions in children. They demonstrated a statistically significant effect on postoperative pain (SMD -1.07; 95%CI -2.08;-0.07) and anxiety and distress (SMD -0.34 95% CI-0.66;-0.01 and SMD -0.50; 95% CI-0.84;-0.16). Our preliminary results in addition to the results of this meta-analysis will be presented here.

CONCLUSIONS
We hope our trial will demonstrate sufficient scientific evidence to claim the beneficial effects of perioperative musical interventions to alleviate pain and anxiety in children and adolescents.

PW3TH04: DOES MINIMAL-INVASIVE SURGERY IN NEONATAL AGE CAUSE CEREBRAL DAMAGE AND NEUROLOGIC DEFICITS?

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Longer operating times and intraoperative metabolic and circulatory changes have risen concerns for the application of minimal-invasive surgery (MIS) in neonates. Especially because neonates present some physiologic peculiarities that make them more vulnerable. There are no studies reporting on neurologic outcome following MIS in neonatal age so far.

Between 2008 and 2015 71 neonates with congenital diaphragmatic hernia (CDH) underwent MIS, in 22 it was converted to open-surgery (OS) and in 130 nonECMO-patients OS was performed. There was no difference regarding gestational age or birth-weight.

In MIS-patients the incidence of liver-up and patch-repair was significantly lower than compared to OS-patients (liver-up: 6/71 vs. 63/130; $p<0.000001$; patch: 17/71 vs. 102/130; $p<0.000001$). Thoracoscopy was applied with a pressure of 3-5 mm Hg, a flow of 1 l/min and discontinued insufflation. During intraoperative monitoring, pH-values were kept >7.2, $PaCO_2$ < 70 mm Hg and $SatO_2$ >90%. Patients were followed in a distinct follow-up-program until adolescence with regular neurologic investigation. No significant difference between patient-groups could be identified with mean-values within normal age-matched range.

Longterm-follow-up until adolescence with neurologic testing is essential to detect neurologic deficits after major neonatal surgery. If the vulnerable physiology is taken into account and parameters are kept within near-normal physiologic range, no neurologic deficits could be detected during early follow-up. Yet it has to be awaited, whether these patients show e.g. learning-deficits at older age.

Adequate patient-selection and close interdisciplinary exchange between experienced neonatologists, pediatric surgeons and pediatric anaesthesiologists is crucial to apply MIS safely - especially in vulnerable neonates.

PW3TH05: THE MUSCULOSKELETAL DEFORMITIES IN CONGENITAL DIAPHRAGMATIC HERNIA

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AIM OF THE STUDY
With the advancement in the treatment strategies of congenital diaphragmatic hernia (CDH), there is an increase in the survival rates. This increase led to an increase in the morbidity and extrapulmonary complications in long term such as failure to thrive, hernia recurrence, neurodevelopmental delay, gastrointestinal problems, and musculoskeletal anomalies. Herein, we aim to investigate the association between the long-term musculoskeletal complications in CDH patients and regarding the defect size, repair type, and perinatal parameters.

METHODS
After Institutional Review Board approval was obtained (2017-6361), a retrospective chart review was performed on CDH patients from 2003 to 2016. Patients who were operated due to left-sided isolated congenital diaphragmatic hernia and survived to date were included in the study. Data were collected on demographics, preoperative characteristics, operative interventions, and postoperative outcomes. Statistical analysis was performed with IBM SPSS Statistics 20.0.0 (Chicago, IL).

MAIN RESULTS
There were 98 patients of whom 33 (28.90%) had primary repair, 35 (30.70%) had patch repair, and 46 (40.40%) had muscle flap repair. The median age of the patients was 6.00±3.83 years. Forty-five patients (45.9%) had large diaphragmatic defects, 28 patients (28.6%) had at least one type of musculoskeletal deformities, 2 of which were pectus carinatum, 16 were pectus excavatum and 18 were scoliosis.

CONCLUSIONS
Although there was a trend towards an increased risk of the pectus deformity and scoliosis in patients repaired with muscle flap, it did not reach statistical significance.

CDH Repair Type	pectus excavatum			scoliosis		
	RR	95% CI	p	RR	95% CI	p
Primary	0.66	0.23-1.88	0.422	0.24	0.06-1.01	0.025
Patch	0.97	0.35-2.74	0.959	1,12	0.45-2.84	0.807
Muscle Flap	1,45	0,59-3,54	0.414	2,28	0,97-5,37	0.053

Table 1: The relative risks (RR) of pectus excavatum and scoliosis deformities per repair type in congenital diaphragmatic hernia patients. (CI: Confidence interval)

PW3TH06: CONGENITAL DIAPHRAGMATIC HERNIA MANAGEMENT AND OUTCOME DOES SIDE MATTER?

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AIM OF THE STUDY

It remains controversial whether babies with right-sided congenital diaphragmatic hernia (R-CDH) have distinctive characteristics and outcome. The aim of this study was to determine the incidence of R-CDH babies and to evaluate management and outcome of R-CDH compared to left-sided CDH (L-CDH).

METHODS

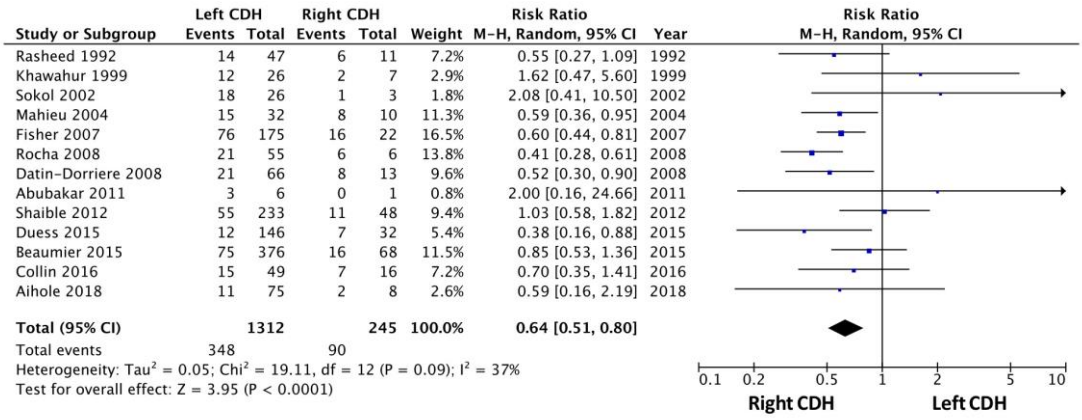
Using a defined strategy (Pubmed, Cochrane, Scopus), we conducted a systematic review of the literature searching for all studies reporting the incidence, prenatal diagnosis, management and outcome of infants born with R-CDH. Exclusion criteria were bilateral CDH and Morgagni's hernia. Meta-analysis was performed on studies comparing R-CDH vs. L-CDH, using RevMan 5.3.

MAIN RESULTS

Of 1,411 abstracts screened, 71 met the search criteria and were included in this study. Incidence: of 10,578 infants born with CDH, 1,692 (16%) had R-CDH. Prenatal diagnosis: R-CDH was less likely to be diagnosed prenatally than L-CDH (50% vs. 73%, p<0.00001, 8 studies). Management: extra-corporeal membrane oxygenation was more often used in R-CDH (34%) than in L-CDH (25%, p<0.01 - 8 studies); similarly the patch repair rate was higher in R-CDH (61%) compared to L-CDH (46%, p<0.0001, 7 studies). Outcome: infants with R-CDH had a higher mortality rate (37%) than those with L-CDH (27%, p<0.0001, 11 studies-**figure**).

CONCLUSION

To the best of our knowledge, this is the first study that has systematically analyzed the features and outcome of infants with R-CDH. The defect laterality seems to strongly impact the management and outcome of these babies. Further studies are needed to understand the underlying pathophysiology of R-CDH.



PW3TH07: ASTHMA MEDICATION USE IN CONGENITAL DIAPHRAGMATIC HERNIA SURVIVORS: A RETROSPECTIVE POPULATION-DATA ANALYSIS

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AIM OF THE STUDY

The purpose of this study was to determine if congenital diaphragmatic hernia (CDH) survivors had worse long-term respiratory outcomes compared to age-matched controls, measured by inhaled bronchodilator use, inhaled steroid use, and asthma-related physician visits. *Methods:* We performed a retrospective case-control study of all infants born with Bochdalek-type CDH at our centre from 1991-2013.The primary outcomes measured were inhaled bronchodilator prescriptions, inhaled steroid prescriptions, and asthma-related physician visits between 0-5 years-of-age and 5-10 years-of-age. Subgroup analysis compared inhaled bronchodilator and inhaled steroid prescriptions for cases grouped by: birthweight, gestational age, defect side, defect size, liver herniation, hernia sac, and pulmonary hypertension. *Main results:* 56 cases and 753 controls met the inclusion criteria for the 0-5 years-of-age analysis. Between 0-5 years-of-age: 32(57.1%) cases versus 264(35.1%) controls were prescribed an inhaled bronchodilator (OR=2.47[1.38-4.48], p=0.001); 19(33.9%) cases versus 152(20.2%) controls were prescribed an inhaled steroid (OR=2.03[1.07-3.74], p=0.03); and, 18(32.1%) cases versus 149(19.8%) controls had an asthma-related physician visit (OR=1.92[1.00-3.56], p=0.04). For the 5-10 years-of-age analysis, 38 cases and 491 controls met the inclusion criteria. Between 5-10 years-of-age, cases did not have more inhaled bronchodilator prescriptions, inhaled steroid prescriptions, or asthma-related physician visits. No differences in inhaled bronchodilator or inhaled steroid prescriptions for either age group correlated with clinical characteristics.

CONCLUSION

A history of CDH is associated with more inhaled bronchodilator prescriptions, inhaled steroid prescriptions, and asthma-related physician visits from 0-5 years-of-age compared to age-matched controls. However, this difference resolves by 5-10 years-of-age.

PW3TH08: THORACOSCOPICRESECTION OF CONGENITAL LUNG MALFORMATIONS (CLM) IN INFANTS: INTRAOPERATIVE EVALUATION WITHCEREBRAL AND SOMATIC NEAR INFRARED SPECTROSCOPY(NIRS) MONITORING

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AIM OF THE STUDY
Evaluation of cerebral and somatic oxygenation with NIRS in infants with CLM during thoracoscopic resections.

METHODS
Retrospective evaluation of thoracoscopic resections for CLM performed in our Centre (July 2016 - October 2018). All patients underwent tracheal ventilation and were positioned in lateral-prone decubitus. Two 3mm and one 5mm trocars were inserted, and capnothorax was maintained at 4-6mmHg with1 l/min. Data from standard monitoring, cerebral and somatic NIRS recordings were collected intraoperatively both at critical surgical moments and continuously throughout surgery. Every decrease of the regional oxygenation > 20% of the basal value, or every absolute decrease < 50% lasting over 3 minutes was considered as potentially pathological.

MAIN RESULTS
13 patients were included, with a mean age at surgery of 8.28±6.19 months (range 4-25) and weight of 7.98±1.93 Kg (range 6.6-13.5). 9 lobectomies, 1 bronchogenic cyst resection and 3 sequestrectomies have been performed. No significant decrease of the cerebral and somatic oximetry was registered during the punctual evaluation. The continuous NIRS monitoring showed decreases of the cerebral oximetry > 20% in 2 patients (15%), respectively lasting 38 minutes, after prone-lateral decubitus positioning, and 65 minutes, 8 of which <50%, after CO_2 insufflation.

CONCLUSIONS
The thoracoscopic treatment of CLM with 4-6 mmHg CO_2insufflation pressure seems safe in infants, especially if combined with monitoring devices able to quickly identify conditions at risk of cerebral hypoperfusion.

PW3TH09: VOCAL CORD PARALYSIS AFTER CARDIOVASCULAR SURGERY IN CHILDREN

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OBJECTIVES
To assess the incidence of vocal cord paralysis (VCP) after cardiovascular surgery in children, to identify the factors potentially associated with this outcome and to assess the diagnostic utility of laryngeal ultrasound (US).

METHODS
Retrospective review of patients which underwent aortic repair and patent ductus arteriosus (PDA) ligation surgeries from 2007 to 2017 at a single institution. The following data were collected: Patient demographics, gestational age, weight and age at surgery, comorbidities, cardiovascular anomaly and type of procedure, laryngoscopic and US evaluation results. Univariate and multiple logistic regression models were used to identify variables associated with VCP.

RESULTS
206 were included in the study. 68 patients (33%) were pre-term and 32.5% showed comorbidities.At surgery, mean age and mean weight were 5.6 months (range, 0.07-206.7 m.) and 4.1 kg (range, 0.4-55 kg) respectively. Postoperatively, symptomatic patients underwent endoscopic evaluation and VCP was detected in 25 patients (12.1%). Laryngeal US was performed in 8 of these cases showing an excellent diagnostic correlation. Factors statistically significantly associated with VCP were prematurity, a younger age and a lower weight at surgery, and the comorbidities.

CONCLUSIONS
VCP is not an unusual complication of cardiovascular surgery in children. Albeit some factors in our series showed a potential association with VCP development, only the presence of preoperative comorbidities was a statistically significant risk on multivariate analysis, though weight at surgery almost achieved significancy. Flexible laryngoscopy is the standard diagnostic technique although laryngeal US appears to be a reliable complement.

PW3TH10: MECHANICAL VERSUS CHEMICAL PLEURODESIS AFTER BULLECTOMY FOR PRIMARY SPONTANEOUS PNEUMOTHORAX: A SYSTEMIC REVIEW AND META-ANALYSIS

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AIM
Primary spontaneous pneumothorax (PSP) and its high recurrence rate poses a therapeutic challenge. We aimed to compare the efficacy of mechanical versus chemical pleurodesis to prevent recurrence for PSP after thoracoscopic bullectomy.

METHODS
Studies published up to 2018 were searched from Medline, Embase, Google scholar and Cochrane databases. A meta-analysis of randomized controlled trials (RCT) and observational cohort studies (OCS) comparing outcomes between mechanical and chemical pleurodesis after bullectomy for PSP was performed.

RESULTS
Six studies (1 RCT and 5 OCS) were included, comprising 923 cases of mechanical (801 abrasions and 122 pleurectomies) and 874 cases of chemical (832 talc and 42 minocycline) pleurodesis. There were 1 pediatric study, 4 adult and 1 mixed studies; mean patient age was 26.6 and 28.7 years for mechanical and chemical pleurodesis respectively. The recurrence rate of pneumothorax after chemical pleurodesis (1.3%) is significantly lower than mechanical pleurodesis (4.2%) [pooled odds ratio (OR)=3.76; 95% confidence interval (CI) 1.88-7.53; P=0.0002; I^2=0%]. Hospital stay was also slightly shorter in chemical pleurodesis group [pooled mean difference (MD)=0.43 day; 95% CI 0.12-0.72; P=0.005; I^2=0%]. There were no statistically significant differences in postoperative complications and operative time between these two groups.

CONCLUSION
In combination with bullectomy, chemical pleurodesis is superior to mechanical pleurodesis for PSP in reducing hospital stay and recurrence rate. However, more RCTs with longer follow-up are necessary to demonstrate the benefit of chemical pleurodesis for PSP, especially in pediatric population.

Table 1: Characteristics and outcome of studies included in the meta-analysis

Study (Author, Year)	Study type	No. of cases	Pleurodesis Methods	Operative time (minutes)	Recurrence N (%)	Complications N(%)	Hospital stay (days)	Age at operation (years)	Follow-up time (months)
Alayouty 2011	RCT	Mech : 42 Chem: 42	Abrasion Minocycline	85±5 87±3	2 (4.8%) 0 (0%)	6 (14.3%) 5 (11.9%)	5±2.3 4±4.5	Mech: 29±3.2 Chem: 27±5.3	36±4
Bialas 2008	OCS (retrospective)	Mech : 31 Chem: 6	Abrasion Talc	NA	2 (6.5%) 0 (0%)	NA	NA	16.5(13-20)	46 (6-104)
Moreno-Merino 2012	OCS (retrospective)	Mech : 399 Chem: 388	Abrasion Talc	46±12.3 37±11.8	11 (2.8%) 4 (10.3%)	46 (11.5%) 14 (3.6%)	4.7±2.5 4.3±1.8	Mech : 25.2 Chem: 29.4	NA
Shaikhrezai 2011	OCS (retrospective)	Mech : 255 Chem: 189	Abrasion Talc	NA	8 (3.1%) 2 (1.1%)	NA	NA	28.4±10.4	73
Zabaleta 2011	OCS (retrospective)	Mech : 74 Chem: 32	Abrasion Talc	NA	3 (4.1%) 1 (3.1%)	5 (6.8%) 4 (12.5%)	NA	Mech : 27.3 Chem: 31.2	38
Cardillo 2000	OCS (retrospective)	Mech: 122 Chem: 217	Pleurectomy Talc	NA	12 (9.8%) 2 (1.0%)	NA	NA	28.4(12-69)	38 (2-72)

RCT: randomized controlled trials; OCS: observational clinical studies; Mech: Mechenical pleurodesis; Chem: Chemical pleurodesis

PW3TH11: ESOPHAGEAL REPLACEMENT BY STOMACH OR COLONIC INTERPOSITION IN CHILDREN. COMPARATIVE ANALYSIS OF TREATMENT RESULTS

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The purpose of this study was to compare the results of treatment of children who had esophageal replacement.

MATERIALS AND METHODS

From 2009 to 2015 172 patients who were underwent esophageal replacement in our hospital were analyzed.

The operated children were divided into 2 groups. Group 1 (main) - 46 children aged from 2 months to 13 years were made plastics of the esophagus with the stomach pull-up.

Group 2 (control) consisted of 126 children aged from 2 months to 18 years who were underwent colonic interposition. In both groups, children with atresia and cicatrical stenosis of the esophagus prevailed.

For evaluation of immediate and long-term results of treatment, the following methods were used: clinical observation, OGD, contrast radiography, CT and MRI studies and patient questionnaires.

RESULTS

There were no complications in the early postoperative period in 54% of cases in group 1 and in 54.4% of cases in group 2.
In groups with postoperative complications additional surgical interventions were made: more in group 1 (23.9%) compared with group 2 (10.3%). Statistically significant indicators (p = 0.04).

The patients' quality of life in the compared groups points at statistically significant differences in the frequency of almost all the complications of the long-term period. The patients with colonic interposition have a better quality of life.

CONCLUSION

A higher quality of life in children after colonic interposition compared with children after a stomach pull-up allows us to consider this operation more preferable in choice of surgical treatment in children.

PW3TH12: TYPE III OR IV LARYNGOTRACHEOESOPHAGEAL CLEFT REPAIR BY A NEW COMBINATION OF LATERAL THORACO-CERVICAL AND LARYNGOSCOPIC APPOACHES

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AIM OF THE STUDY
Type III or VI laryngotracheoesophageal cleft (LTEC) is extremely rare with high mortality and morbidity. Herein, we present our strategy not only for life-saving but also for preserving laryngeal function for infants with those types of LTEC, by using a combination of lateral thoraco-cervical and laryngoscopic approaches (LTC-LS).

METHODS
Three infants with type III or IV LTEC underwent airway reconstruction by LTC-LS, which was composed of two sequential surgical approaches. Firstly, through a right lateral thoracotomy and a right cervical incision, the cleft from the third tracheal ring through to the main-stem bronchi was repaired with the aid of extracorporeal membrane oxygenation. Secondly, following tracheostomy, the remaining cleft from the arytenoids to the second tracheal ring was treated by laryngoscopic suturing.
[Main results] The age and weight at the time the total length of LTEC was finally repaired was 140 days and 4 kg, 153 days and 6.3 kg, and 258 days and 2.8 kg. The follow-up period was 5.67, 1.75, 0.21 years, respectively. The first patient subsequently gained breathing, swallowing, and vocal functions, and withdrew from gastrostomy. The other two were in training for the above functions.

CONCLUSIONS
Our reconstruction strategy by sequential LTC-LS may be beneficial for patients with type III or IV LTECs, in terms of excellent access to both the intrathoracic and extrathoracic portion of the LTEC without damaging laryngotracheal structures or recurrent nerves. The strategy may facilitate the preservation of laryngeal function as well as stable airway reconstruction.

PW4UR01: INCIDENCE OF HYPOSPADIAS IN NEONATES DIAGNOSED WITH INTRA-UTERINE GROWTH RESTRICTION

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AIM OF THE STUDY
The incidence of hypospadias is 1:250 male live births [Gearhart, J, Rink, R, Mouriquand, P. Pediatric Urology (2010). Philadelphia: Saunders/Elsevier]. We aimed to appraise the incidence of hypospadias in neonates diagnosed with intra-uterine growth restriction (IUGR) and identify factors affecting the presence of hypospadias.

METHODS
Retrospective 2-year review of male live births diagnosed with IUGR at a tertiary center. Data are reported as number of cases (%), mean (SD), odds ratio (OR) with [95% confidence interval]. Logistic regression analysis was used to identify factors affecting the presence of hypospadias in association with IUGR. P value <0.05 was considered significant.

RESULTS
We identified 236 live births diagnosed with IUGR. Ten (4.5%) cases of hypospadias were identified at birth (OR 11 [1.4-86.7]; p=0.02 compared to the general population). Nine (4%) patients also presented a renal tract abnormality and 16 (6.8%) undescended testes. Mean IUGR onset was 32 (±4.4) weeks gestation. Maternal age was 30 (±5.6) years. Logistic regression analysis identified previous multiple pregnancy (OR 2.6 [1.3-5.4]; p=0.006) and twin pregnancy (OR 6.1 [1.2-31.3]; p=0.03) to be associated with higher incidence of hypospadias. Maternal age, gestational age at IUGR onset, gestational age and weight at birth were not associated with increased incidence of hypospadias.

CONCLUSIONS
In our experience, the incidence of hypospadias is more than 10-fold higher in patients with IUGR. Risk factors include multiple previous pregnancies and twin pregnancy. There is, however, need for large prospective studies to better understand the relationship between IUGR, maternal factors and hypospadias.

PW4UR02: ROBOT-ASSISTED LAPAROSCOPIC PYELOPLASTY (RALP) IN CHILDREN WITH HORSESHOE KIDNEYS: RESULTS OF A MULTICENTRIC STUDY

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AIM OF THE STUDY
This multicentric study aimed to report the outcome of robot-assisted laparoscopic pyeloplasty (RALP) for treatment of pelvi-ureteric junction obstruction (PUJO) in children with horseshoe kidneys (HSK).

METHODS
The records of 14 patients (11 boys and 3 girls with an average age of 9 years), who underwent RALP for repair of PUJO in HSK in 5 international pediatric urology units over a 5-year period, were retrospectively reviewed. The transperitoneal robotic ports were placed more caudally than usual for improved access to the PUJ. A dismembered pyeloplasty with no division of the isthmus was performed in all cases.

MAIN RESULTS
The average operative time including docking was 143.5 minutes (range 100-205). No conversions to laparoscopy or open surgery neither intra-operative complications occurred. Patients were discharged on post-operative day 2 following catheter and drain removal. The JJ stent was removed at mean 33 days postoperatively. Overall success rate was 92.8%. As for postoperative complications, we recorded a urinary tract infection (UTI) and stent-related irritative symptoms, managed conservatively, in 2 patients (II Clavien) and one anastomotic stricture, successfully treated with a robot-assisted redo-pyeloplasty (IIIb Clavien). At follow-up, all patients (one after redo-surgery) reported complete resolution of symptoms, improvement of hydronephrosis on ultrasound and no residual obstruction on diuretic renogram.

CONCLUSIONS
Our results suggested that RALP in HSK is safe, feasible and with good medium-term outcomes in expert hands. An accurate pre-operative planning associated with a standardized technique are key-points to achieve good surgical and functional outcomes in these challenging cases.

PW4UR03: IMPACT OF DISTAL HYPOSPADIAS REPAIR ON QUALITY OF LIFE AND LONG-TERM PSYCHOSOCIAL DEVELOPMENT

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AIM OF THE STUDY
To evaluate the impact on quality of life (QoL) and the long-term psychosocial development in patients who underwent urethral advancement for distal hypospadias repair.

METHODS
A total of 42 patients aged ≥ 13 years old were operated between 2009-2010 (median age at surgery: 48 months). Seventeen children agreed to participate in our study. We adapted the Pediatric Quality-of-life measurement tool (PinQ) to the presence of a penile malformation (h-PinQ). We eliminated question 20 because it was unrelated to our study. Psychological General Wellbeing Index (PGWBI) was used to determine current psychosocial development.

MAIN RESULTS
Patients considered their QoL slightly affected by the presence of a penile malformation (h-PinQ = 6.1). Likewise, parents' evaluation of QoL of their children was similar to theirs (h-PinQ 7.3, intraclass correlation coefficient: 0.84 [95% CI: 0.64-0.94 p <0.01]). Only one patient showed a moderate deterioration of his QoL (h-PinQ = 20). This patient had a low score in PGWBI (54 points) related to a bad punctuation in well-being and anxiety-depression subscales. In contrast, PGWBI score was > 80 in most patients (15/17), considered as a good psychosocial development. There was a good-moderate correlation between h-PinQ and PGWBI (kappa coefficient: 0.47 [95% CI: 0.3-3.4 p <0.001]).

CONCLUSIONS
There was minor impact on QoL of chidren who underwent urethral advancement for distal hypospadias repair.

We found a good-moderate correlation between h-PinQ and PGWBI to assess QoL and psychosocial development in patients with distal hypospadias

PW4UR04: CROSSED FUSED RENAL ECTOPIA (CFRE) AND ASSOCIATED CONGENITAL ANOMALIES

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AIM OF THE STUDY
Crossed-fused renal ectopia (CFRE) has a 1:7000 incidence in cadaveric-studies. Knowledge of the pattern of associated anomalies is limited. This large cohort-study explores the associated anomalies.

METHODS
With institutional approval, electronic radiology reports from 2002-2018 were searched for 'crossed', 'fused', 'ectopia'. Records of patients identified were retrospectively-reviewed for associated anomalies and the need for surgical intervention related to the CFRE, compared to isolated CFRE (Fisher's exact test).

MAIN RESULTS
139 patients were identified, 52(37%) female, 87(58%) male(M:F=1.7:1), aged 0-18yrs at last review. CFRE was an isolated finding in 58(41%). 81(59%) had other congenital abnormalities or syndromes.

Anomalies included 22/139(16%) vertebral/spinal, 34/139(24%) anorectal malformation including 7 cloacal anomaly, 27/139(19%) cardiac, 10/139(7%) tracheal, 5/139(3.5%) oesophageal and 11/139(8%) limb: 31/139(22%) had 3 or more features of VACTERL.

Other associations included: 4/139(3%) branchio-oto-renal syndrome, 2/139(1.5%) Trisomy-21, 2/139(1.5%) Kabuki syndrome, 2/139(1.5%) cloacal exstrophy, 2/139(1.5%) posterior urethral valves, 3/139(2%) DSD (Turner syndrome, mixed-gonadal-dysgenesis, 5-alpha-reductase deficiency), 2/139(1.5%) megalourethra and 4/139(5%) proximal hypospadias.

During a median 5yr follow-up (range 0-18yrs) 8/139(5.7%) patients required surgical intervention for CFRE, 2/58(3%) in the isolated cohort compared to 6(7%) in the cohort with other anomalies, p=0.46.

CONCLUSIONS
CFRE is strongly associated with VACTERL: we recommend spinal imaging and echocardiography screening.

Only a minority of patients required surgery for CFRE complications.

Associated anomalies do not appear to impact need for surgical intervention for CFRE.

PW4UR05: COMPARING THE OUTCOMES OF TUBULARIZED INCISED-PLATE URETHROPLASTY AND DORSAL INLAY GRAFT URETHROPLASTY IN CHILDREN WITH HYPOSPADIAS: SYSTEMATIC REVIEW AND META-ANALYSIS

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BACKGROUND

The tubularized incised-plate urethroplasty (TIPU) and the dorsal inlay graft urethroplasty (DIGU) are two of the most commonly used techniques for hypospadias repair in children. However, there is a lack of consensus on which technique offers more favourable results.

AIMS

To systematically compare the reported outcomes of TIPU and DIGU techniques in an effort to determine the procedure of choice in children undergoing primary hypospadias repair.

METHODS

An electronic database search was conducted up to May 2018. Sources included Medline, Embase, Cochrane library, CINAHL, Web of science, Google Scholar, and grey literature. Selected studies compared operative complications of TIPU and DIGU in children. Secondary outcomes included standardized cosmetic scores and urinary flow studies. A meta-analysis of reported complications was performed using a random-effects model.

RESULTS

Two randomized, two prospective, and two retrospective studies met the inclusion criteria. TIPU and DIGU were performed in 350 and 267 patients respectively. Pooled analysis did not demonstrate a significant difference regarding post-operative urethrocutaneous fistula, meatal/urethral stenosis, wound dehiscence, or total complications. Subgroup analysis according to hypospadias severity did not alter initial findings. Sensitivity analysis with exclusion of retrospective studies demonstrated a significant increase in post-operative meatal/urethral stenosis and total complications after TIPU. Most studies were of low methodological quality with a high risk of bias.

CONCLUSIONS

There is no strong evidence to suggest that either technique offers more favourable outcomes. Until more robust randomized trials exist, decisions regarding the appropriate repair should be based on the surgeon's experience and outcomes.

PW4UR06: THE EFFECTS OF TOBACCO CONSUMPTION ON PATERNITY RATES OF ADULTS WITH A HISTORY OF CRYPTORCHIDISM

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OBJECTIVE

To determine the effect of tobacco consumption on paternity rates in men with a history of unilateral and bilateral cryptorchidism compared to a control group.

METHODS

A total of 153 previously cryptorchid men(116 unilateral and 37 bilateral) and a control group of 100 men for a total of 257 participants were studied by review of medical records and a questionnaire.

RESULTS

A total of 197 men filled the tobacco information of the questionnaire(76.7%). Paternity rates were lower among men that consumed tobacco compared to nonsmokers. Paternity rates were similar between unilateral cryptorchid men(ULC) and the control group with no statistical difference(48.39% vs 51.61% P:0.79). Similarly, there was no statistical difference between bilaterally cryptorchid men (BLC) and the control group of men that smoke(P:0.075). Successful paternity in the bilateral cryptorchid smoker group was of 18.2%.

Comparing tobacco consumption in the UCL group, paternity rates were lower in smokers(37.21%) compared to nonsmokers(62.73%) this difference was not significant(p:0.35). Paternity rates in BLC smokers were lower than nonsmokers(28.57% vs 71.43%), this difference was not statistically significant(p:0.36). There was no difference between the paternity rates of cryptorchid men with mild, moderate or heavy tobacco consumption compared to nonsmokers.

CONCLUSIONS

Paternity rates were lower in all groups studied except formerly unilateral cryptorchid men vs controls. These lower paternity rates were not statistically significant in any group. More studies are needed to determine the impact of tobacco consumption on paternity rates of formerly cryptorchid men.

PW4UR07: EVOLUTION OF TESTICULAR VOLUME IN ADULT PATIENTS THAT UNDERWENT ORCHIDOPEXY AS CHILDREN: A 15-YEAR FOLLOW-UP

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OBJECTIVES

To determine the effect that orchidopexy has on testicular volume compared with the contralateral testicle. Determine the relationship between age of intervention and long-term testicular volume. Testicular volume assessment by ultrasound controls compared with normal testicular growth curves.

METHODS

Patients who underwent orchidopexy and post-operative testicular ultrasound performed after the intervention (average 14.93 years) in a total of 216 testicular units. Data are taken from the location of the testicle and epididymal junction aspect. Statistical analysis of the testicular volume ultrasound was performed.

RESULTS

No significant differences were observed in the distribution of testicular volume according to groups of extra-abdominal testicular location. Statistically significant differences were observed(P = 0.0038) in the distribution of testicular volume related to epididymal disjunction. There is no linear correlation between the age of surgical treatment and testicular volume in the total population. Statistically significant differences were observed(P = <0.0001) in the distribution of testicular volume according to groups of operated and contralateral testicles as well as between unilateral and bilateral testicles. Statistically significant differences were observed in the proportion of the testicular volumes of the testicles intervened compared to the normal testicular growth curve.

CONCLUSION

Orchiopexy results in a lower testicular volume than the contralateral testicle of normal descent. The older the surgical treatment, the greater the affectation of the postpuberal volume, this correlation becomes flattens over time.

The testicles with complete testicular epididymal disjunction, have a smaller volume. There is no relationship between extra-abdominal testicular localization and postoperative testicular volume.

PW4UR08: URETEROSCOPIC LASER ENDOPYELOTOMY IN RECURRENT PELVI-URETERIC OBSTRUCTION (R-PUJO) IN PEDIATRIC AGE: MULTI-CENTERS EARLY EXPERIENCE

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AIM

To evaluate safety, efficacy and feasibility of Ureteroscopic Laser endopyelotomy in R-PUJO in Pediatric age group

PATIENTS AND METHODS

The evaluation included 13 patients, who's age ranged from 20 month to 13 years old. Out of the 13, 12 patients were symptomatic. The thirteenth, youngest had a PUJO of the lower moiety of duplex kidney and had initial surgery uretero-ureterostomy. This same patient had persistent dilatation of the lower moiety on follow up. All patients have US, MAG3 pre -operative and 7 of them had MRU. All had followed up US in 3,6,12 months and MAG3 after 12 months of the procedure.

RESULTS

The average operative time was 45 minutes (range from 30 to 60 minutes) and hospital stay range from 1-3 days. An efficacious clinical and functional outcome was maintained after an average follow up of 12 months (range from 8 to 24 months). All symptomatic children have completely relieved with improvement in radiological (US & MAG3) follow up. The youngest patient showed considerable improvement which was confirmed radiologically.

CONCLUSION

The outcome of our study has revealed that the Pediatric uretroscopic laser endopyelotomy in R-PUJO is safe and feasible procedure, it could replace redo surgery

PW4UR09: IS EMERGENCY SCROTAL EXPLORATION FOR TESTICULAR TORSION MANDATORY?

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AIM OF THE STUDY
Evaluate the safety of manual detorsion (MD) with deferred orchiopexy in patients with testicular torsion (TT).

METHODS
A retrospective analysis of all patients with the diagnosis of TT submitted to MD in emergency room (ER) between January 2015-December 2018. In our department, all patients submitted to MD have a color doppler sonography to confirm testicular blood flow restoration. Then, patients are reffered to our outpatient clinic and elective bilateral orchidopexy is scheduled. All patients are advised to return to ER in case of they notice any sign of TT recurrence while awaiting for an elective surgery.

MAIN RESULTS
A total of 61 patients were admitted to the ER with TT. 34 (56%) had a successful MD. The median age for MD was 14 years [min 6; max 17]. Median onset of pain was 2 hours [min 0.5; max 10]. All patients became clinically asymptomatic after the procedure. The elective orchiopexy was performed within a median period of 12 days [min 6; max 54]. Two patients (6%) presented testicular pain while waiting for the elective orchidopexy. One had a normal ultrasound, and one had TT. The later was submitted to MD and delayed orchidopexy was performed 27 days after.

CONCLUSIONS

MD is an easy procedure that can be done immediately in ER. It decreases testicular ischemia time and improves patients' symptoms in an instant. In our experience, combining successful MD with deferred bilateral orchidopexy is safe as long as patients are aware of TT recurrence signs.

PW4UR10: PALOMO SURGERY AND ANTEGRADE SCROTAL SCLEROTHERAPY IN TREATMENT OF ADOLESCENT VARICOCELE: A 10-YEAR REVIEW

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AIM OF THE STUDY

Varicocele is a common condition with several types of treatments. We aimed to review and compare the surgical outcomes of Palomo lymphatic sparing laparoscopic approach (LPS) with the antegrade scrotal sclerotherapy (SAS) at our center.

METHODS

A retrospective analysis was done of our patients,aged between 8 and 20 years old, treated from January 2009 to December 2018. Were considered: age, side, grade, type of treatment and operative data, clinical recurrence and complications.

MAIN RESULTS

331 patients were included: 249/331 had an LPS procedure, 82/331 had a SAS procedure. At the time of the recovery the median age was 14,5 for the first group and 14 for the second one, all the patients presented an idiopathic left-sided grade III varicocele. The operative time was 44,79 min (25-60 min) for the LPS group, 35,58 min (22-46 min) for the SAS group.

Then we have focused on the outcome. In the LPS group we had 8(3,2%) recurrent varicoceles, 6 grade I/II and 2 grade III. In the same, we had 22 (8,8%) patients presenting hydrocele, 7 requiring surgical correction.

Instead, in the SAS group, we had 2 (2,4%) patients with recurrent varicocele, 1 grade I and 1 grade III. The prevalence of hydrocele was lower: we had 1 (1,2%) case, surgically corrected.

Both groups showed 1 postoperative hematoma.

CONCLUSION

Both LPS and SAS esult to be safe procedures, with similar clinical recurrence rate; SAS shows a significant lower rate of postoperative hydrocele($p<0,05$).

	LPS (%)	SAS (%)	P value
Total = 331	249 (249/331=75,2%)	82 (82/331=24,8%)	
Varicocele recurrence	8 (8/249=3,2%)	2 (2/82=2,4%)	0,72 (p>0,05)
Grade I/II	6 (6/249=2,4%)	1 (1/82=1.2%)	0,83 (p>0,05)
Grade III	2 (2/249=0,8%)	1 (1/82=1,2%)	0,74 (p>0,05)
Hydrocele	22 (22/249=8,8%)	1 (1/82=1,2%)	0.03 (p<0,05)
Other complications	1 (1/249=0,4%)	1 (1/82=1,2%)	0,99 (p>0,05)
Operative time	44,79 min (25-60 min)	35,58 min (22-46 min)	0,27 (p>0,05)

Table 1

PW4UR11: RISK FACTORS FOR RECURRENT URETEROPELVIC JUNCTION OBSTRUCTION AFTER PYELOPLASTY

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AIM OF THE STUDY
Persistent or recurrent ureteropelvic junction obstruction after a pyeloplasty is an uncommon complication which management remains challenging. The aim of our study is to identify the risk factors associated with recurrent ureteropelvic junction obstruction.

METHODS
Retrospective chart review of patients who underwent pyeloplasty from 1997 to 2017 at our institution was performed. The study focused on patients with recurrence of ureteropelvic junction obstruction after the initial surgery. Demographic data, clinical, surgical and radiological variables were assessed. A multivariate logistic regression analysis was performed in order to identify risk factors for surgical complications and need for redo-surgery.

MAIN RESULTS
340 pyeloplasties were performed and 10 children underwent redo-pyeloplasty for secondary obstruction in this period. The independent risk factors for redo-surgery in a multivariate logistic regression model were: urinary leak (OR=6.92, 95%CI:1.16-41.35) and bigger anteroposterior diameter of the renal pelvis (OR=1.05, 95%CI:1.003-1.101). Sex, age, weigh, side, surgical approach (open and laparoscopy) and differential renal function did not have an impact on the need of redo-surgery.
Older age (in months, OR=1.01, 95%CI:1.002-1.02), higher preoperative differential renal function (OR=1.04, 95%CI:1.01-1.08) and the use of stent across the ureterovesical junction (OR=3.32, 95%CI:1.26-8.76) are independent risk factors for urinary leak.

CONCLUSIONS
There is a trend toward recurrent ureteropelvic junction obstruction in patients with urinary leak after pyeloplasty and those with higher preoperative anteroposterior diameter of the renal pelvis. Older patients, higher preoperative differential renal function and stent across the ureterovesical junction are independent risk factors for urinary leak.

PW4UR12: DEMOGRAPHICS OF HYPOSPADIAS – ARE WE HEADING TO ANOTHER GLOBAL CATASTROPHE?

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BACKGROUND / AIM
There have been numerous reports in recent decades suggesting both that there are widespread oestrogenising pollutants in the natural world, and suggesting that hypospadias was becoming more common in the human population. We wished to document this suggested increase, and to look for features of the condition that might suggest cause.

METHODS

A 30 year retrospective chart review of hypospadias was performed. Annual incidence by birthday was compared to local population data. Clinical features were recorded on Excel and appropriate statistical tests applied.

RESULTS

831 valid patient records from 1987 to 2017 were abstracted. The incidence increased by 1% per annum from 53 up to 83/10,000 live male births in 2017. The percentage of cases with meatus proximal to coronal groove increased from 11% to 26%. There was a trend for a decrease in positive family history – from 5% in the first ten years to 1% in the final ten years. In addition the percentage with associated undescended testis was also trending upwards, from 3% to 4.5% (NS).

DISCUSSION

The increasing incidence and severity of hypospadias is clear. Data on family history and associated conditions is incomplete, but what data there is, is consistent with a non genetic insult resulting in increased risk of hypospadias and probably also UDT.

CONCLUSIONS

The findings confirm previous observations of an increasing incidence of hypospadias, show an increasing severity, and are consistent with but do not prove an environmental influence in aetiology.

The study was carried out with appropriate institutional approval.

PW5UR01: ROUTINE VOIDING CYSTOURETHROGRAPHY BEFORE PYELOPLASTY IN CHILDREN: IS IT REALLY NECESSARY?

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INTRODUCTION

Ureteropelvic junction obstruction (UPJO) and vesicoureteral reflux (VUR) are common congenital urologic abnormalities. If pyeloplasty is indicated for an infant, we routinely perform voiding cystourethrography (VCUG) before surgery. For elder patients,we utilize VCUG if he/she has ureteral dilatation and/or febrile urinary tract infection(UTI). The aim of this study was to evaluate the necessity of routine VCUG in patients with UPJO.

PATIENTS AND METHODS

Medical records of 170 patients who underwent pyeloplasty between 2005-2017 were retrospectively reviewed. Data including sex, presence of VUR, ureteral dilatation, and preoperative febrile UTI were collected.

RESULTS

VUR-UPJO coexistence was detected in 24 (16%) of 150 patients who had preoperative VCUG. VUR was present in 33 (11.2%) of 295 renal units and the majority were low-grade (90.9%). Only three of 24 patients had undergone antireflux surgery. Pre-operative febrile UTI history was present in 8 (33.3%) of 24 UPJO patients with VUR,and in 34(27%) of 126 UPJO patients without VUR (p=0.119). VUR was detected in 2 (28%) of 7 patients with ureteral dilatation (p=0.190). M/F ratio was 3.6/1 in the group without VUR; and 3.2/1 in the group with VUR (p=0.723).

CONCLUSION

Vesicoureteral reflux coexistent with UPJO was mostly of low-grade. Routine VCUG examination before pyeloplasty in UPJO cases may not be necessary due to the low reflux grade, no significant relation with febrile UTI, and low intervention rates for reflux. The presence of ureteral dilatation does not also justify routine VCUG in infants with UPJO subjected to pyeloplasty.

PW5UR02: LAPAROSCOPIC VASCULAR HITCH FOR POLAR VESSELS IN PYELO-URETERAL JUNCTION SYNDROME: LONG TERM RESULTS OF A MONOCENTRIC EXPERIENCE

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GOAL
To evaluate long term results of the management of patients with pyelo-ureteral Junction syndrome (PUJ) secondary to lower-pole vessels according to the description of Mushtaq et al

MATÉRIEL ET MÉTHODE
We performed a retrospective mono-centric study of all patients who were operated using this technique by transperitoneal laparoscopy (TL) or robotic surgery from 2011 to 2018.

RESULTS
During the study period, 25 patients (11 males, 14 females) with a mean age of 11.1 years-old were managed. Initial symptoms leading to the diagnosis were present in 21 children (Lumbar pain 17, HTA 1, infection 3). 4 patients were diagnosed incidentally (3) or following a prenatal screening (1).
3 immediate post-operative complications were noticed including 1 ITU, 1 urinary tract rupture and 1 post-operative massive dilatation.
After a mean follow up of 3 ±1.5 years, 17 patients remain asymptomatic. Mean pelvic diameter was pre-operatively 35mm and post-operatively 10.5mm ($p<0.005$).
Of the 8 remaining patients, 6 required re-operation and 2 remained symptomatic.

CONCLUSION
In our experience, PUJ managed by vascular hitch technique is associated with a 68% success rate after 3 years. These results are different from the current literature (Villemagne et al) which reported success rate of 96% after 52 months.
It leads us to question the efficiency of this technique in the long term in our hands both concerning the indications and the surgical procedure itself. Further studies are required to collect data concerning the evolution of our patients during adulthood in order to compare their evolution to classic pyelopasty.

PW5UR03: TREATMENT OF HIGH-GRADE VESICOURETERAL REFLUX IN INFANTS - THE PARENTS' EXPERIENCE

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AIM OF STUDY
Optimal management of infants with high-grade vesicoureteral reflux (hVUR) is debated and there is no active treatment superior to others regarding preserving renal function. Qualitative studies are needed to increase the understanding of parents' perspective. This study aims to describe parents' experiences of antibiotic prophylaxis (CAP) and surgical intervention (SI).

METHODS
Four semi-structured focus-group-discussions were conducted with 13 mothers/6 fathers of 15 children (1.5-6 years, 2/3 boys) treated for hVUR with CAP (2 groups) and SI (2 groups). Discussions were recorded, transcribed and qualitatively analysed with content analysis.

MAIN-RESULTS
The discussions yielded 2700 parent-reported statements of VUR management, whereof 300 pertained to CAP and 200 to SI. Additional themes regarded health-care (660), UTI (410), diagnostic procedures (380), time of diagnose (360), remaining family-impact (210), renal damages (80) and other (100).
Negative experiences (255) regarding CAP emerged in all focus groups; worry and guilt if failing the child's CAP-intake (85), stress of bearing the responsibility (50), risks of long-term use (50) and negative influence on the children's food preference (25).
Experiences from anaesthesia and surgical care were positive (85) and negative (100); stress and inadequate information affected the experience negatively, whereas empathy, accurate information and adequate preparation positively.

CONCLUSIONS
Focus groups permit parents to openly describe their experiences.
The use of CAP has everyday impact on family life, while parents' concerns of SI are related to an isolated occasion, which can be optimized by proper care.
Parents' perspectives should be considered when managing infants with hVUR.

	Examples of statements from the parents of infants with high-grade VUR
CAP	"It builds up stress inside...in the sense that you have to make them take it"
	"And somehow it´s your fault if he gets ill...because then you have failed..."
	"We crushed the pills, mixed them with water and forced it into her mouth while we held her...she hated it"
	"I still thought that this would result in multi-resistant bacteria...that this couldn't be good..."
SI	"The anaesthesiologist was so great talking to us before and being so calm so it felt better when they put him to sleep"
	"The worst thing was the anaesthesia, when they put the mask against her face, and she really fought, like a death-struggle"
	"It's really scary when their body get lifeless in your arms"

PW5UR04: ABDOMINAL PAIN IN ADOLESCENTS: BEWARE OF TESTICULAR TORSION

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AIM OF THE STUDY

Testicular torsion (TT) remains an important cause of testicular loss and is time-related. Subtle presentations such as abdominal pain, may be responsible for late diagnosis and high testicular loss rate. In the present study we assessed the influence of pain onset localization over testicular outcome.

METHODS

Retrospective analysis of pediatric patients with TT treated between 1/01/2017 and 31/12/2018. Demographics, clinical presentation and outcome were reviewed.

MAIN RESULTS

73 patients (aged 15.3 [13.5-16.3] years) were included. The demographics, clinical presentation and outcome, as well as comparison between abdominal versus testicular pain, are shown in the table. Abdominal pain showed a significant delay in TT diagnosis/treatment and was associated with a significantly higher rate of testicular loss. The majority of testicular losses occured in patients with abdominal pain (63%, 12/19). In patients with abdominal pain, TT was initially overlooked in 69% (11/16), resulting in 81% (9/11) gonadal losses; all the patients with testicular pain were evaluated in order to exclude TT.

CONCLUSIONS

Abdominal pain is not a rare presentation of TT, being an important cause of delayed diagnosis/treatment and associated higher testicular loss rate.

	Abdominal pain (n=16, 22%)	Testicular pain (n=57, 78%)	Abdominal vs testicular (p value)
Age, years (median [IQR])	15.1 [13.0;15.8]	15.3 [13.7;16.5]	.75 (Mann-Whitney U 2-tailed test)
Pain duration, hours (median [IQR])	36 [14.3;72]	5 [2;7]	< .001 (Mann-Whitney U 2-tailed test)
Orchiectomy/Atrophy	12 (75%)	7 (12%)	< .001 (Fisher exact test)

IQR, interquartile range

PW5UR05: ESWL IN CHILDREN IN ONE-DAY SURGERY – SAFE AND EFFECTIVE TREATMENT OF UROLITHIASIS IN CHILDREN – A PROSPECTIVE STUDY

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INTRODUCTION
The development of ESWL equipment over the years has made it safe and effective. The aim of the study is to show the possibility of performing ESWL treatment in children of all age groups in the one-day surgery mode as a safe, effective and reducing treatment costs.

MATERIAL AND METHOD
The full data evaluation assessed 420 children (aged 1 – 18; mean 8,7) treated for urolithiasis with the application of ESWL method. The procedures were done since 2010. The treatment was applied to children with stones in the kidney and in the ureter. All surgeries was performed under anesthesia – analgo-sedation. Stone size range 5-22 mm, mean 10.7. The length of the treatment is from 35 to 60 min. The length of stay is from 5-7 hours, in the children's urology department one day. Energy fractionation during the procedure was used. Pulse frequency = 1 / sec. Treatment was carried out under constant ultrasound control. C-arm was used for localization less than 8% of deposits.

RESULTS

Overall efficiency was 89%. Only 4% after the follow-up ultrasound required admission to the hospital to perform URS-L surgery. Stein strasse was observed in 3 cases. Hematuria in 30%. Cost of treatment was reduce up to 60%.

CONCLUSIONS

ESWL is the treatment of choice for lithiasis in children. As a one day surgery procedure it can reduce children and parents stress associated with admission to the hospital.

PW5UR06: URETHRAL ADVANCEMENT IN DISTAL HYPOSPADIAS. COSMETIC AND FUNCTIONAL EVALUATION OF LONG-TERM RESULTS

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AIM OF STUDY
To evaluate the cosmetic and functional outcome of patients who underwent urethral advancement (Koff procedure) for distal hypospadias.

METHODS
We included 42 patients older than 13 years old who underwent urethral advancement between 2009-2010 (median age at surgery of 48 months). A total of 17 patients completed the assessment. Two surgeons independently evaluated the cosmetic result (HOPE score), while parents' and patients' appraisal was based on PPPS. An uroflowmetry was obtained and correlated with symptoms by an objective score (DVSS) to evaluate the functional outcome.

MAIN RESULTS
Out of 42 children, one presented urethral valves, another one had hydrocele; cryptorchidism was associated in one child and fetal-alcohol syndrome in another patient. Most children (37/42) had a distal meatus; in 5 the location was midshaft. Urethral advancement, orthoplasty and a Firlit skin collar was performed in all patients. Mean follow-up was 110 months. Five patients presented postoperative fistula, one child had a meatal stenosis and another one haematoma. All of them were treated surgically (7/42; 16%). Regarding cosmetic evaluation, all 17 patients were satisfied with their penile cosmesis (PPPS=12.41), as well as parents (PPPS=12.75) and surgeons (HOPE=46.5; intraclass correlation coefficient= 0,6 [95%CI: 0.2-0.8; $p<0.01$]). Concerning functional outcome, uroflowmetry was abnormal in 6/17, but only one patient had dysfunctional voiding symptoms (DVSS=12) compatible with voiding postponement.

CONCLUSIONS
Urethral advancement is a suitable alternative for distal hypospadias repair with low complication rate. We obtained satisfactory cosmetic and functional results from the point of view of patients, parents and surgeons.

PW5UR07: RETROSPECTIVE ANALYSIS OF MORE THAN A DECADE OF BOTULINUM-A TOXIN FOR REFRACTORY DIYSFUNTIONAL VOIDING IN PEDIATRIC PATIENTS

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AIM OF THE STUDY
The use of botulinum toxin-A (BTX-A) in detrusor sphincter dyssynergia (DV) was described many years ago. The aim of the study is to review 13 years with intrasphinteric injection of BTX-A in female pediatric patients with refractory DV**.**

METHODS
We did a retrospective study (2005-2018) collecting these patients. Patients with neurological disorders, urogenital reconstructive surgery, and not standardized management were excluded. 100 IU of BTX-A diluted in 4 mL of saline was injected at the 4 quadrants of the urethral sphincter. It was an outpatient procedure in all cases. The median follow-up was 25.84 months.

MAIN RESULTS
20 female were included, between 5 and 14 years old. All patients presented with trigon cistitis (4 had trabeculated bladder). Cystoscopy was repeated in 10 patients and showed an improvement in trigon cystitis.
Mean maximum flow rates before and after the procedure were 18.07 mL/s and 28.46 mL/s, respectively (p=0.02). In 84.61% there was an improvement in urodynamics. 61.53% had a complete resolution of UTI. A PVR below 20 mL after BTX-A was present in 69.23%. Only 3 patients experienced a UTI within 15 days after the intervention. 10 children needed following injections in an average of 4 occasions (range 2-6) after the temporary effect of BTX-A. In two patients urinary incontinence of 2 weeks duration after the treatment occurred.

CONCLUSIONS
The use of BTX-A in selected pediatric patients with refractory DV as a safe and effective technique to improve urinary voiding and protect the renal function.

PW5UR08: PREVENTING THE O IN OHVIRA (OBSTRUCTED HEMIVAGINA IPSILATERAL RENAL AGENESIS): EARLY DIAGNOSIS AND MANAGEMENT OF ASYMPTOMATIC HERLYN-WERNER- WUNDERLICH SYNDROME

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AIM
Herlyn-Werner-Wunderlich syndrome (HWWS) is a rare variant of Mullerian ductal anomaly associated with ipsilateral renal agenesis. Most patients are diagnosed after menarche with complications of obstructed hemivagina. Our institution manages several HWWS patients diagnosed before symptoms via screening for antenatally-diagnosed renal agenesis. This study aims to improve the pre-symptomatic management of HWWS patients.

METHODS
We carried out retrospective case review of patients diagnosed with HWWS from 2010 to 2018 on patient demographics, symptoms, clinical course, management and follow-up.

RESULTS
There were 10 patients with HWWS. Seven patients had early diagnosis through postnatal ultrasound screening. Subsequently, one patient required vaginal drainage at 2 months old for prolapsing hydrocolpos, the rest remained asymptomatic on follow-up: 5 are still prepubertal and one underwent elective vaginal septum resection shortly after menarche. One postpubertal patient had incidental diagnosis during laparoscopic appendicectomy for acute appendicitis. Only 2 patients presented with haematocolpos requiring vaginal surgery.

CONCLUSIONS
There is low awareness of HWWS with mainly postpubertal case series diagnosed with complications of uterovaginal obstruction, genitourinary infection, endometriosis and pelvic adhesions. Patients often undergo additional operations for misdiagnosis or treatment of complications. Our case series and review of literature show that the majority of prepubertal patients with HWWS do not require early gynaecological surgery. We recommend that female babies with renal agenesis should be screened for HWWS syndrome with ultrasound. Early diagnosis and pre-symptomatic elective surgery may prevent urogynaecological complications that cause fertility and renal impairment.

PW5UR09: MINIMAL INVASIVE URETER REIMPLANTATION IN CHILDREN WITH VESICOURETERAL JUNCTION OBSTRUCTION

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AIM OF THE STUDY was to investigate the effective of minimal invasive ureter reimplantation in children with primary obstructive megaureter.

METHODS

42 patients with primary obstructive megaureter (51 ureter units) in the age from 8 month till 9 years old were operated – extravesical approach without cystotomy were done for ureter reimplantation. Ultrasound, DMSA and MAG3 dynamic scintigraphy, VCUG were done in all of them initially and after the operation. Ureter narrowing Was necessary in 28 cases, when the ureter diameter was more than 30mm and bladder volume less 70ml.

MAIN RESULTS

First investigation in the 6-12 month after the operation shows the excellent results in 12 patients – it was minimal dilatation of upper urinary tract without VUR and save kidney function. In 28 patients urodynamic and kidney function improvement became in the second or third year after the operation. In 2 cases it was postoperative vesicoureteral reflux, which was successfully treated by endoscopically bulking agent injection. Both of them were under the 1 year of age.

CONCLUSIONS

Minimal invasive extravesical wide ureter reimplantation without bladder wall incision is the save and effective method for children of all ages, especially upper 1 year old. Results of the reimplantation must be evaluated during the 3 years after.

PW5UR10: IS SCREENING FOR LONG-TERM VUR RECURRENCE AFTER ENDOSCOPIC TREATMENT NECESSARY?

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AIM
Endoscopic treatment became the first choice when conservative approach fails in the majority of patients with VUR; however, there're still no postoperative follow-up guidelines.Our current approach is obtaining a VCUG in the postoperative third month and repeat it only in clinical suspicion to decrease radiation exposure.The aim of this study is evaluating our strategy.

METHODS
Records of 395 patients underwent endoscopic treatment between 2007-2016 were reviewed retrospectively in terms of postoperative UTI, need for secondary VCUG and recurrence.

RESULTS
Among all, 351 patients were compliant with our complete protocol. Of these, 332 (94%) had no VUR in the third month VCUG.The other 19 either downgraded or required secondary surgery. Seventeen (5%) of 332 patients underwent a secondary VCUG (after a mean follow-up of 25 months) for having culture proven febrile UTI. Bladder-sphincter dysfunction was observed in 18% of the patients who didn't and 59% of the patients who underwent a secondary VUR(p=0.021).Three of these 17 patients showed recurrence. One patient had de novo contralateral VUR. Mean operation age was 68.4 months for the patients with recurrence and 79.5 months for the ones without(p=0.287).Event free interval was 26.7 months for the patients with recurrence and 24.5 months for the ones without(p=0.522).All three patients with recurrence and 7/14 without had secondary VUR(p=0.999).

CONCLUSIONS
Late recurrence after successful endoscopic treatment is rare.Repetetive VCUGs may be ommited to decrease radiation exposure by close UTI follow-up.Other causes including bladder dysfunction should be considered initially even in patients with febrile infections.

PW5UR11: MANUAL DETORSION AND ELECTIVE ORCHIOPEXY AS AN ALTERNATIVE TREATMENT FOR TESTICULAR TORSION IN CHILDREN

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AIM
To present our experience in pediatric patients with testicular torsion (TT) treated by manual detorsion (MD).
Patients and Methods. Retrospective analysis of patients treated by MD in a 10-year period in a single center. Description of symptoms, detorsion technique, follow-up and complications.

RESULTS
76 patients with diagnosis of TT were studied in a 10-year period. 16 patients were treated by MD. Mean age was 12 years (Range:10-13 years) and time from onset of pain was 5,25 hours (±4,2). Left testicle was affected in 75% (n=12). Detorsion maneuver was performed by a pediatric surgeon at the radiology room, in counter-clockwise direction in the right testicle and clockwise direction in the left testicle in all cases. The success was defined as the relief of pain, normal physical examination and was confirmed by Doppler ultrasound performed immediately after MD. MD was effective in 75% (n=12) and orchiopexy was performed under elective conditions at median time of 2 weeks (0-5 weeks). MD was unsuccessful in 3 patients and emergency orchiopexy was performed with no testicular loss. 1 patient had a second MD maneuver for incomplete detorsion. No short or long term complication nor testicular atrophy was observed.

CONCLUSION
MD and elective orchiopexy seems to be an efficient and reliable procedure in the treatment of TT in children. Further studies may be necessary to establish its safety and indications.

PW5UR12: ON-TABLE URODYNAMIC WITH URETERIC OCCLUSION: A NOVEL APPROACH TO MEASURING BLADDER CAPACITY AND COMPLIANCE IN PATIENTS WITH GROSS VESICO-URETERIC REFLUX

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AIM

Accurately assessing bladder capacity and pressure in patients with gross vesico-ureteric reflux (VUR) is impossible due to the dampening effect of the dilated upper tracts. Therefore, it is possible for standard urodynamics to overestimate bladder capacity (BC) and significantly underestimate bladder pressure. We aimed to compare BC and pressure measurements performed with and without ureteric occlusion in patients with marked VUR.

MATERIAL AND METHODS

Under general anaesthesia a guide-wire is inserted into both ureters. An hysterosalpingogram catheter (single lumen 5.5Fr with 1.5ml balloon) is passed through VUJ into the distal ureter. Balloon is inflated with contrast to occlude it. The guide wires are withdrawn and a dual lumen urodynamic catheter inserted into the bladder. Bladder capacity and Compliance (C=Δbladder volume/Δdetrusor pressure) are recorded and compared with values obtained at standard VUD (without ureteric occlusion).

RESULTS

Two patients had both tests 5 months apart. In one patient, the occluded and non-occluded tests demonstrated bladder capacity >450 ml and 590 ml (VUR from 80 ml). The end-fill detrusor pressure (Pdet) of both tests were <10 cmH2O. In the second, there was marked loss of compliance with a Pdet >65 cmH2O after 95 ml with the ureters occluded. In contrast, during the non-occluded VUD bladder appeared of normal capacity and compliance (with gross VUR).

CONCLUSIONS

On-table urodynamics with ureteric occlusion allows for significantly more accurate assessment of bladder capacity and compliance in the presence of marked VUR and can represent a new and useful tool in the management planning

PW6HB01: CHOLELITHIASIS IN CHILDREN: IS CHOLECYSTECTOMY BECOMING A MORE FREQUENT SURGICAL PROCEDURE IN CHILDHOOD?

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AIM OF THE STUDY

To examine the changes in frequency of cholecystectomies performed in the last twenty years and to determine the trends in the incidence of cholelithiasis in children.

METHODS

The case records of 45 children who underwent cholecystectomy due to cholelithiasis from January 1998 until December 2017 were retrospectively reviewed. The patients were divided into two groups regarding the year of surgery (Group I: 1998-2007; Group II: 2008-2017) and compared by demographic and anthropometric data, clinical findings, indications for surgery, procedure type and treatment outcomes.

RESULTS

The number of cholecystecomies has increased from 11 in the period 1998-2007 to 34 in the period 2008-2017 (p=0.002). The median age of children has risen from 11 to 15.5 years (p=0.001) and the average BMI has increased from 19.2 cm/m^2 to 23.0 cm/m^2 (p=0.012). The share of hereditary spherocytosis within the indications for cholecystectomy has decreased from 63.6% to 11.8% (p=0.0005) in favour of the diagnoses that are etiologically related to cholesterol stones, whose proportion has increased from 27.3% to 70.6%, according to spectrophotometric analyses (p=0.006). The frequency of laparoscopic cholecystectomy has increased from 36.4% to 85.3% (p=0.0005).

CONCLUSIONS

The number of cholecystectomies in children has increased threefold in the last twenty years and the average BMI of observed children is significantly higher in the last ten years compared to the BMI in the ten years before that, which means that there is a correlation between the rising obesity rates in pediatric population and the increase in frequency of symptomatic cholelithiasis.

PW6HB02: LIVER TRANSPLANTATION IN PEDIATRIC PATIENTS EVOLUTION OF THE NATIONAL PROGRAM OVER THE PAST TWO DECADES

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AIM OF THE STUDY

Liver transplantation (LTx) in children has become one of the most successful transplants of solid organs. The aim of this study was to evaluate the outcomes of national pediatric LTx program during the past two decades.

METHODS

Total of 143 LTx were performed in 120 pediatric patients over the period 9/1995 – 10/2018, aged from 8 weeks to 18 years (mean age 8.3 ± 5.9 years), weight 2.8 kg – 93.0 kg (mean weight 21.8 ± 19.3 kg). The most prevalent indication for LTx was biliary atresia (32.3%), followed by metabolic disease (10%), Wilson disease (9.2%) and tumors (5.4%). Re-transplantation was performed in 19.2 % of children, 2.5% (3 patients) underwent 3 transplantations. Transplants were performed with a whole graft - 60 transplant procedures (42 %), reduced graft – 27 (18.9%) or split graft – 56 procedures (39.2%), and 3 transplants were from a living donor.

RESULTS

The mean time patients spent on the waiting was 116 ± 176.1 days. Patients' survival rates after 1 and 5 years were 87.3% and 81.1%, respectively. Grafts' survival rates after 1 and 5 years were 75.1 % and 68.2 %, respectively.

CONCLUSIONS

Our study showed high both patients' and grafts' survival rates after pediatric liver transplantation over past two decades. Despite higher initial morbidity (due to the introduction of partial liver grafts), these results proved a successful national pediatric LTx program.

PW6HB03: ROUTINE PORTAL VENOUS ULTRASONOGRAPHY AFTER SPLENECTOMY RECOMMENDED?

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INTRODUCTION AND AIM

Splenectomy is a common procedure. The most serious complication is portal (PVT) and mesenteric venous thrombosis. In this study, the incidence of PVT after splenectomy was evaluated.

PATIENTS AND METHODS

Patients who underwent splenectomy between 2006 and 2018 were retrospectively analyzed by age, gender,postoperative ultrasonography results.

RESULTS

There were 112 patients who underwent splenectomy. 64 (57%) male and 48 (43%) female. The average age is 10.9 ± 0.8 years. Laparoscopic surgery was performed in 83 patients (74%) and 29 (26%) patients. Portal venous Doppler ultrasonography (PVDU) was performed in 27 (24%) patients after 10.9 ± 22.9 (1-87) months postoperatively. 15 of them were open and 12 had laparoscopic splenectomy. In 24 patients (89%) with USG, portal ven lumen calibration was normal, hepatopedal flow and respiratory response were observed naturally. All patients had clear splenectomy and 3 patients (11%) had 'chronic portal vein thrombosis secondary fibrosis and cavernous transformation of the portal hilus'. Primary diseases of PVT patients were sickle cell anemia (n = 2) and immun thrombocytopenic purpura (n=1). Sickle cell anemia was performed in a patient diagnosed with portal venous embolism and follow-up was smooth. Two patients are out of follow-up.

CONCLUSION

PVT development in splenectomy patients is rare but important complication. Hemolytic anemia is the second most common risk factor. With the controversy over whether the surgical method makes a difference in terms of increased risk, there was no patient who developed PVT after this serial laparoscopic splenectomy. Follow-up with routine PVDU after splenectomy is recommended

PW6HB04: NEW LAPAROSCOPIC TECHNOLOGY IN CHILDREN

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AIM
Evaluation of the effectiveness of new technologies in the treatment of liver cysts in children.

METHODS
The study included 25 children with liver cysts of various etiologies the hydatid cyst, congenital and past traumatic cysts. Cyst size ≥ 3 cm. The location in the V, IV, VII segment of the liver. For the period from 2013 to 2018. The average age was 9.7 ± 2.8 years. There were 16 boys and 9 girls. Surgery was performed using a multiport laparoscopic technique using a device for endoscopic recovery of infected biological material (Patent RU170304).

RESULTS
The duration of surgery 68 ± 3.5 minutes. The removal of cysts was 8.7 ± 2.0 minutes. Duration of pain syndrome 2 ± 0.7 days. Intraoperative complications in our observations were not observed. Relapse is not observed. Due to the rounded end of the endoscopic device, the tissue trauma is avoided. Also the work area is reduced during endosurgical intervention. In addition, due to hermetic contact provides complete removal of the components of the cyst.

CONCLUSIONS
In this way laparoscopic cystectomy with the use of a vacuum endoscale and the treatment of the residual cavity with argon plasma coagulation is an effective operation for liver cysts in children.

PW6HB05: PRENATAL DIAGNOSIS OF CONGENITAL PORTOSYSTEMIC SHUNT AND CLINICAL IMPLICATIONS FOR POSTNATAL MANAGEMENT

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AIM OF THE STUDY

Congenital portosystemic shunt (CPSS) is a rare vascular anomaly causing wide range of clinical manifestations and complications. Due to advances in prenatal imaging technology, CPSS has been diagnosed prenatally more often. However, no consensus has been reached regarding its diagnostic criteria or postnatal management.

METHODS

Among 27 patients with CPSS diagnosed and treated at our hospital since 1995, five children were diagnosed during the prenatal period. Demographic data, diagnostic clues, type of CPSS, and postnatal outcome were studied retrospectively.

Main results

The gender was 4 male and one female. The gestational age at prenatal diagnosis ranging from 22 to 34 weeks. The associated diseases were none in three patients, cardiac anomalies (VSD, ASD) and 21 trisomy in two. The type of CPSS was extrahepatic in three and intrahepatic in two (EHPS, EHPC, HPC in one each, PH in two according to Blanc's classification). Detection of the absence of ductus venosus (ADV) and porto-hepatic venous shunt (PHS) by fetal imaging provided an important clue to the prenatal diagnosis of CPSS in three and two patients, respectively. Shunts of HPC and PH type closed spontaneously by the age of two years, while EHPS and EHPC type continued patent causing abnormal laboratory tests, and they were successfully treated with surgical ligation or being in the planning stage.

Conclusions

Findings including ADV or PHS by fetal imaging may contribute prenatal diagnosis of CPSS, which provides important clinical implications for appropriate management planning in patients with CPSS before its complications develop.

PW6HB06: CHRONOLOGICAL CHANGE IN POSTOPERATIVE BIOCHEMICAL DATA IN BILIARY ATRESIA. LAPAROSCOPIC VERSUS OPEN PORTOENTEROSTOMY

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BACKGROUND

Monitoring biochemical data after laparoscopic (LPE) or open portoenterostomy (OPE) for biliary atresia (BA).

METHOD

We classified 28 LPE and 16 OPE into: Group1: Liver transplantation (LTx) or pre-LTx death without jaundice clearance (JC: T-bil≤1.2mg/dL); Group2: LTx after initial JC; and Group3: no LTx. Biochemical data obtained prospectively, at 1, 3, 6, 12, and 18 months, thence annually for 2-9 years, postoperatively were used to subdivide Group3 into biochemical status categories (BSC) defined as: A: all normal; B: only cholinesterase (ChE) abnormal; C: only aspartate aminotransferase (AST) and alanine aminotransferase (ALT) abnormal; D: only platelet count (PC) abnormal; E: only ChE normal; F: only AST/ALT normal; G: only PC normal; and H: all abnormal.

RESULT

Mean age/weight at LPE versus OPE were: 65.1 days/4.3 kg versus 69.1 days/4.6 kg, and mean follow-up: 3.7 years (range: 0.2-9.4) versus 3.5 years (0.9-12.0) were similar (*p*=NS). At review, 20/28 in LPE and 7/16 in OPE were survivors with native livers. JC was achieved in 23/28 (82.1%) in LPE and 10/16 (62.5%) in OPE (*p*=NS). Survival with the native liver was in 20/28 (71.4%) in LPE and 7/16 (43.8%) in OPE (*p*=NS). C (abnormal AST/ALT) was the most common BSC in both LPE and OPE (*p*=NS) (Fig 1). E (only ChE normal) was prominent in LPE throughout our study; differences were significant from 2-12 months ($p<0.05$) but not at 18 months and 2 years.

CONCLUSIONS

Outcome after LPE would appear to be comparable to OPE.

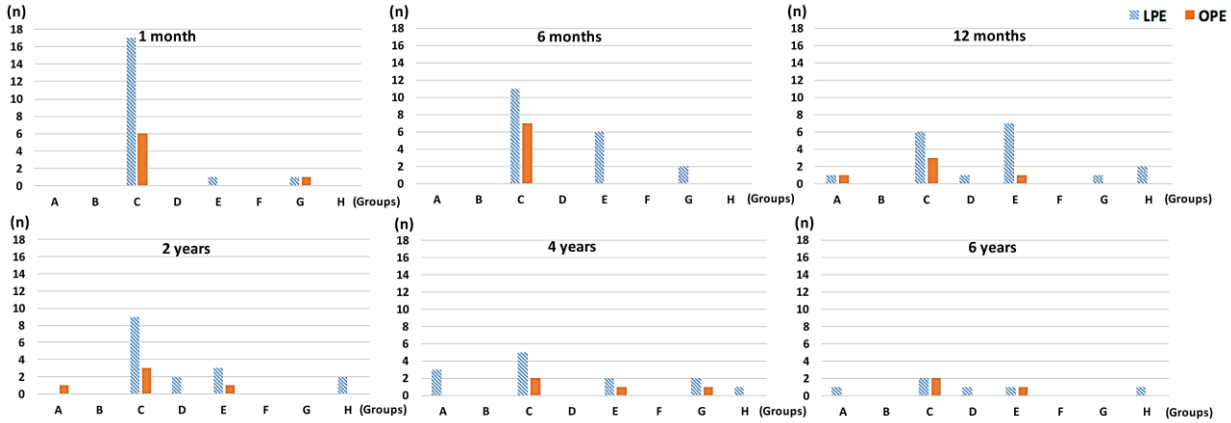

Fig. 1: Chronological change in data for cholinesterase (ChE), aspartate aminotransferase (AST), alanine aminotransferase (ALT), and platelet count (PC). Biochemical status categories (BSC) were A: all normal; B: abnormal ChE only; C: abnormal AST/ALT only; D: abnormal PC only; E: normal ChE only; F: normal AST/ALT only; G: normal PC only; H: all abnormal.

PW6HB07: DOES THE TECHNIQUE OF THE LIVER RESECTION EFFECT THE BLOOD TRANSFUSION REQUIREMENT IN CHILDREN?

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AIM OF THE STUDY
Up to 40% of adults receive blood transfusions (BTx) during and after liver resection. Data is limited in children. We aimed to determine the rate of BTx requirement in children undergoing hepatic resection for various liver tumors.

METHODS
Records of patients with liver tumors undergone hepatic resection between 2004 - 2018 were reviewed retrospectively. Diagnosis, BTx requirements (intraoperative and/or within first 24 hours postoperatively), preoperative hemogram and hemorrhagic diathesis tests, tumor diameters, details of procedures and postoperative morbidity were evaluated.

Patients were grouped according to the types of resection as being **"anatomic"**(**AR:**n=39**)**or **"irregular"**(**IR:** n=6; i.e. tumor enucluation/wedge or central resection) and the extent of resections as being **"limited resection"**(**LR:** n=38; i.e. lobectomy/segmentectomy), or extended resection (**ER:** n=7; i.e. trisegmentectomy w/wo caudectomy).

RESULTS
Eight of 45 patients (17.7%) including 5 hepatoblastomas, 2 hamartomas and 1 fibrolamellar hepatocellular carcinoma, required BTx. Preoperative hemoglobin level was >10g/dl and hemorrhagic diathesis tests were normal in all. Mean tumor diameter was 72.2±28.8mm. There was no morbidity related to BTx. Table summarizes the BTx requirements related to type of resection, and to extent of resection respectively.

Conclusion: BTx requirement remains limited in children during or after liver resections. Extended resections significantly increase the requirement for BTx. Confinement to the segmental anatomy of liver and experience in different resection techniques are believed to reduce the need for BT.

Table

	BTx (+)	**BTx (-)**	
AR	7	32	
IR	1	5	
			p>0.05
LR	2	36	
ER	6	1	
			p<0.0001

PW6HB09: CHOLECYSTECTOMY IN PEDIATRIC PATIENTS – DEMOGRAPHY, INDICATIONS AND PERIOPERATIVE RESULTS

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BACKGROUND

Cholecystectomy is rarely performed in children. The aim was to present demography and perioperative results in children undergoing cholecystectomy in a pediatric surgical department with local, regional and national referrals.

METHOD

Review of medical records of children below 15 years operated with cholecystectomy 2003 - 2018. Approval from the Institutional Review Board was obtained.

RESULTS

66 patients were identified and included, 27 (41%) boys with a median age of nine (0.2-14.9) years. 55 (84%) operations were elective procedures. The most common indication for cholecystectomy was abdominal pain (39%). Twenty (30%) patients had no comorbidity, and hemolytic disease (27%) was the most common comorbidity. Twenty-three (35%) patients underwent concomitant procedures, of which splenectomy was most frequent (61%). Sixty patients (92%) were operated laparoscopically of which three (5%) were converted. Intraoperative cholangiography was applied in 21 (33%). After a common bile duct injury in 2016, all patients underwent IOC. Twelve (18%) patients had a total of 16 complications, of which two were Clavien-Dindo IIIb (common bile duct injury, postoperative hemorrhage). Twenty-six (39%) patients were operated by trainees assisted by consultants. There was no significant difference in the complication rate of patients operated by trainees (12%) and consultants (23%).

CONCLUSION

Associated comorbidities and concomitant procedures are common in children undergoing cholecystectomy. Serious complications are few. Cholecystectomy performed by trainees under consultant supervision is safe. IOC is recommended in all cases.

PW6HB10: LIVING DONOR LIVER TRANSPLANTATION USING REDUCED SEGMENT 2 MONOSEGMENT GRAFT IN AN INFANT

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BACKGROUND

In pediatric LDLT, monosegmental grafts are used to overcome size discrepancies between adult donors and pediatric recipients. However sometimes problems related to large-for-size graft are encountered.The reduced monosegmental graft has been introduced to address this problem. Herein we report a 5-month old,5 kg infant underwent LDLT by using reduced S2-monosegment graft.

CASE REPORT

5-month old male infant with past medical history of elevated liver enzymes and INR since 40 days old presented with jaundice and lethargy and referred to our center for treatment of acute liver failure.As he was unresponsive to supportive therapy and daily plasmapheresis and his condition deteriorated, the decision to proceed with LDLT from father was made.The predictive GRWR of LLS graft was larger than 4, therefore the use S2-monosegment graft was decided after analyzing intrahepatic vasculature with 3D computer-generated model of the donor liver.S2 graft weighting 240gr was harvested by insitu resection of S3.Further lateral reduction of the S2 graft to 160gr was done on back table.The left hepatic vein of the graft was anastomosed to the common orifice of hepatic veins.The bile duct of the graft was anastomozed to the recipient's main bile duct. Postoperative course was uneventful and the patient is doing well at 6 months of follow-up.

CONCLUSION

LDLT using monosegment grafts offers safe and useful option for treating smaller infants. Although it is technically more challenging, S2-monosegment grafts are better for reducing graft thickness. Brief understanding of vascular anatomy and careful preoperative planning is crucial for successful monosegment LDLT.

PW6HB11: OUR EXPERIENCE OF TYPEC OF SURGERY FOR LIVER HYDATID DISEASE AND RECURENCCES

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AIMS OF THE STUDY

Recurrence after surgical management for cystic liver hydatidosis appears to be high in conservative surgery.Diagnose is founded of the images and laboratory methods for identifying recurrence, prognostic factors and new therapeutic options.

To study the presentation of hydatid disease in children, evaluate the risk factors, and derive appropriate management recommendations for prevention of recurrences (19.79%) and disease control.

METHODS

We retrospectively reviewed the medical records of patients who underwent surgery for cystic hydatidosis between 1998 and 2018 in two pediatric institutes.

MAIN RESULTS

Of the 96 children /their age ranged from 5 to 18 years/ who underwent conservative surgery, follow-up was complete for 86 (89.58%). Cysts recurred in 19 patients (19.79%). Imunological tests,abdominal ultrasonography and computed tomography appeared to be efficient for diagnosing recurrences. The most important determinants for recurrences were minute spillage of the hydatid cyst and inadequate treatment owing in conservativemethods or incomplete pericystectomy in radical surgery. Ten re-recurrences were observed in the follow-up of these patients and also required surgery. We investigate that typ of conservative surgery has perform in cases with recurrences.

CONCLUSION

During surgical removal of hydatid cysts and cysts without a definite preoperative diagnosis, spillage of cyst contents must be avoided (by keeping two suction apparatuses) to prevent anaphylactic reaction,recurreces and multiple hydatidosis.

PW6HB12: APPLICATION OF THE RETRIEVAL BAGS SERVICE IN LAPAROSCOPIC SURGERY OF HYDATID CYST OF THE LIVER

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AIM

Evaluation of the effectiveness of the vacuum - device (VD) in laparoscopic treatment of hydatid cysts of liver in children.

METHODS

The study included 14 children with liver of hydatid cysts during the period 2013 - 2018. The mean age was 8.7 ± 1.4 years. There were 9 boys, 5 girls. The multiport laparoscopic technique of echinococcectomy was performed in 14 children. Aged 3 to 18 years, hydatid cyst of the liver, type I-III by Gharbi / CE1-3, cyst size 3 - 5 cm. Location in IV-VI segment of the liver.

RESULTS

Complications associated with the use of the VD were not noted. The time of laparoscopy with the use of the VD was 72 (59-103) minutes. The extraction time of the chitinous shell was 9.1 ± 2.0 minutes. Depending on the life cycle of the parasite, the duration of use of retrieval bags increased from Type I / CE1 to Type III / CE3 from 6.7 ± 1.5 to 11.1 ± 1.8min. The number of intraoperative the VD used only depended on the stage of the process. hydatid cyst of the liver was: Type I / CE 1 - 1 bag; Type II / CE 1-2 bag; Type III / CE 3 - 2-3 bag.

The study of pain in children, with laparoscopy using VD, showed a decrease in pain syndrome.

CONCLUSIONS

Laparoscopic echinococoectomy with the use of the VD is an effective and safe manipulation for the liver hydatid cysts in children. It is necessary to further study and compares the effectiveness of various devices for the extraction of removed tissues from the abdominal cavity in children.

PW7BS01: MUSCLE REPLENISHMENT THROUGH NATURALLY DERIVED EXTRACELLULAR MATRIX ENGINEERED WITH EXTRACELLULAR VESICLES

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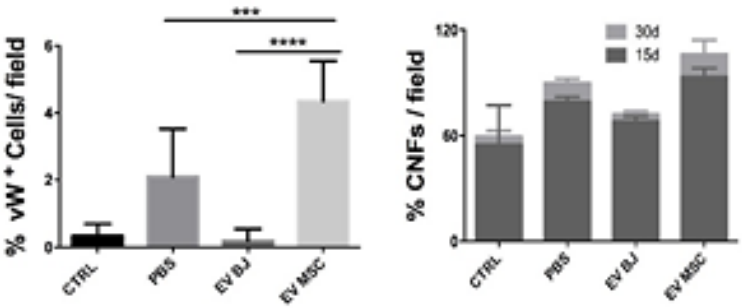
AIM OF THE STUDY
Extracellular matrix (ECM) scaffolds are biocompatible supports for muscle regeneration but leading to limited tissue recovery. Extracellular vesicles (EVs) drive mediating signals for tissue renewal, vascularization and immunomodulation. We investigate the improvement of muscle loss replenishment using muscle extracellular matrix engineered with extracellular vesicles from perinatal mesenchymal stromal cells to diminish fibrosis.

METHODS
ECM samples from detergent-enzymatic treatment were embedded with EVs isolated from Wharton Jelly mesenchymal stromal cells (EV-MSC) and BJ fibroblasts (EV-BJ). EVs have been characterized and the murine volume muscle loss (VML) model has been settled after depletion of 60% of the entire tibialis anterior muscle to mimic a chronic damage. Tailored ECM with EVs have been implanted to replenish the VML, additional EVs injection has been performed 72h post ECM implant. After 7, 15 and 30 days, samples were analysed by histology, immunofluorescence and qPCR. The study obtained ethical approval from our National Institution.

MAIN RESULTS
qPCR for M2-macrophages and myogenic markers showed a clear response toward tissue rebuilding in EV-MSC-treated mice. In the same group collagen quantification resulted in a significant reduction in fibrosis 30 days after implantation. Percentages of vW+cells (neo-angiogenesis) and new centrally nucleated fibers (CNFs) were significantly higher in EV-MSC treated mice when compared to other groups (vW+cells $p<0,005$; CNFs $p<0,0001$) as shown in figure.

CONCLUSIONS
In this preliminary study, ECM engineered with EV-MSC showed a boost on actively replenishing the VML. This approach can be applied to different muscle loss defects such as congenital ones.



PW7BS02: MICRO-STRUCTURED SUBSTRATE ALLOWS EFFICIENT EX-VIVO EXPANSION OF HUMAN CORD BLOOD-DERIVED HAEMATOPOIETIC STEM CELLS: IMPLICATION FOR FETAL AND POST-NATAL THERAPIES

Sindhu Subramaniam[1], Giovanni Giobbe[1], Camilla Luni[2], Winston Vetharoy[1], Panicos Shangaris[3], Alfonso Tedeschi[1], Durrgah Ramachandra[1], Stavros Loukogeorgakis[1], Anna David[3], Nicola Elvassore[1,2], Paolo De Coppi[1]

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AIM OF THE STUDY

Engraftment of umbilical cord-blood (UCB) haematopoietic stem/ progenitor cells (HSPCs) is limited by relatively low cell number, delayed recovery and low chimaerism. The main objective of this study is to evaluate the effect of a confined hypoxic microenvironment on ex-vivo expansion of UCB-HSPCs and their engraftment potential.

METHODS

CD34-enriched UCB cells (term births n=3 collected with consent) were cultured in hydrogel microwells (micro-structured substrate) or plastic cell culture plates in serum-free Stem-span medium (supplemented with cytokines) under hypoxic (5% O2) conditions for 21 days. Day 7, 14 and 21 expanded cells were characterized by multi-colour flow cytometry. 200,000 cells (day 7 or day 14 expanded) were injected intra-venously into NSG mice to assess repopulation efficiency.

RESULTS

Compared to plates, microwell expansion culture enhanced the proliferation potential of CB-HSPCs (500 fold vs 300 fold at day 21, p-value: 0.003). Expression of stem cell markers, CD34 (>90%) and CD133 (>35%) remained high, even at day 10. Bone marrow multi-lineage analysis (7 months) in mice transplanted with day-7 microwell cells showed 63% human CD45 expression compared to 54% in day-7 plate cells and 69% in non-expanded cells (n=3 each). Further, bone marrow analysis (7 months) of mice with day-14 microwell cells showed 34% engraftment compared to 3% of day-14 plate cells (n=3 each/p-value: 0.0084).

CONCLUSION

Our results suggest that the manipulation of the microenvironment augments the expansion of CB-HSPCs ex-vivo and noticeably improves long-term multi-lineage engraftment. Our immediate goal is to elucidate the molecular mechanisms underlying these processes.

PW7BS03: DOWNREGULATION OF PULMONARY GENE EXPRESSION OF HOXA5 AND HOXB5 IN THE NITROFEN-INDUCED CONGENITAL DIAPHRAGMATIC HERNIA

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National Children's Research Centre, Our Lady's Children's Hospital, Dublin, Ireland

AIM

Pulmonary hypoplasia, characterized by smaller lung size and reduced airway branching, remains a major cause of mortality in newborns with congenital diaphragmatic hernia (CDH). Hox genes have been shown to play important roles in many aspects of organogenesis. Wnt2/BMP4 signaling pathway which plays a critical role in branching lung morphogenesis is reported to be downregulated in nitrofen-induced hypoplastic lungs. Hox5 genes are reported to regulate Wnt2/BMP4 signally axis during lung development. Recently it has been reported that Hoxa5 and Hoxb5 double mutant mice develop severely hypoplastic lungs with reduced braching. We designed this study to investigate the hypothesis that the Hox gene expression is altered in the nitrofen-induced hypoplastic lungs in the CDH rat model.

METHODS

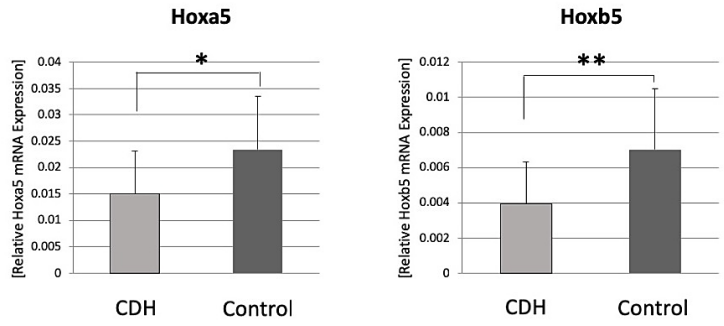
Following ethical approval (REC1103), time-mated Sprague-Dawley rats received nitrofen or vehicle on gestational day 9 (D9). Fetuses were sacrificed on D21 and lung specimens divided into CDH and control (*n*=6 for each group). Quantitative RT-PCR and western blotting were performed to analyze pulmonary gene and protein expression of Hoxa5 and Hoxb5. Immunofluorescence-double-staining for either Hoxa5 or Hoxb5 was combined with a specific lung mesenchymal marker to evaluate protein expression in the lung mesenchyme.

RESULTS

Relative mRNA and protein expression of Hoxa5 and Hoxb5 was significantly decreased in CDH lungs compared to controls (Figure). Confocal-laser-scanning-microscopyrevealed markedly diminished Hoxa5 and Hoxb5 immunofluorescence in CDH lungs compared to controls.

CONCLUSION

Our observations suggest that downregulated pulmonary gene expression of Hoxa5 and Hoxb5 may disrupt lung morphogenesis resulting in pulmonary hypoplasia in the nitrofen-induced CDH rat model.



***p<0.05**
****p<0.01**

PW7BS04: FEASIBILITY OF BILIARY ATRESIA SCREENING USING NEW AI TECHNOLOBY-APPLIED STOOL COLOR DISCREMINATION SYSTEM

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AIM

We reported the diagnostic limitation of nationwide stool color card and the development of AI technology-applied stool color discrimination system (BabyPoop) as the biliary atresia (BA) screening in EUPSA 2017. This time we will report on problems of the initial BabyPoop and starting of a new BabyPoop.

METHODS

Free iOs application was installed in personal cellular phones and tablets in the initial system. The new system was installed on a tablet only and improved to a capable function of photography and diagnosis for multiple babies in one unit. Photography of the stool was carried out at the newborn and infant checkups. The diaper with the stool of the day was used as a subject.

RESULTS

The initial system was released in 2016. There were over 20,000 stool color samples, however they were used for auxiliary BA diagnosis or stool color tracking in the same case, the role as screening was not fulfilled. The new system was launched in December 2018 after the approval of the ethical review board. The time required in judgment was about 5 seconds.

CONCLUSIONS

In order to evaluate whether the application BabyPoop is useful as the BA screening, it is necessary to verify in a group in which many healthy cases are included. In Japan, almost all newborn babies undergo health examination in the first month after birth, so we use new BabyPoop at the same time and proceed with feasibility and practicality of BabyPoop.

PW7BS05: ACCELERATED INTESTINAL EPITHELIAL CELL TURNOVER CORRELATES WITH STIMULATED BMP SIGNALING CASCADE FOLLOWING INTESTINAL ISCHEMIA-REPERFUSION IN A RAT

Yoav Ben-Shahar[1,2], Zaid Abassi[1], Hila Kreizman Shefer[1], Yulia Pollak[3], Udayan Bhattacharya[1], Igor Sukhotnik[2,3]
[1]The Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel. [2]Department of Pediatric Surgery, Dana-Dwek Children's Hospital, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel. [3]Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

AIM OF THE STUDY

Bone Morphogenetic Proteins (BMPs) are a family of proteins that regulate proliferation and differentiation of intestinal epithelial cells. The purpose of this study was to evaluate the role of BMP signaling following intestinal ischemia-reperfusion (IR) in a rat model.

METHODS

Male Sprague-Dawley rats were divided into 4 experimental groups: Sham-24 and Sham-48 rats underwent laparotomy and were sacrificed 24 or 48 hours later, respectively; IR-24 and IR-48 rats underwent occlusion of SMA and portal vein for 30 minutes followed by 24 or 48 hours of reperfusion, respectively. Enterocyte proliferation and enterocyte apoptosis were determined at sacrifice. BMP-related genes and protein expression were determined using Real-Time PCR, Western Blot and immunohistochemistry 48 hours followed IR.

MAIN RESULTS

IR-48 rats demonstrated a significant increase in BMP 4 mRNA (7.5-fold, $p<0.05$) in jejunum, an upward increase in the number of BMP-positive cells (by immunohistochemistry) in jejunal (1.2-fold increase) and ileal (1.4-fold increase) intestinal villi compared to Sham-48 animals. IR-48 rats also demonstrated a significant increase in BMP 4 and BMP 2 protein levels in jejunum (5.8-fold increase, $p=0.02$) compared to Sham-48 animals. Elevation in BMP 2 and BMP 4 levels was associated with increased rates of cell proliferation and decreased cell apoptosis in both jejunum and ileum compared to IR-24 rats.

CONCLUSIONS

Forty-eight hours following intestinal IR in rats, BMP signaling pathway was stimulated. The increase in BMP signaling pathway activity correlates with accelerated cell turnover.

PW7BS06: THE USE OF 3-DIMENSIONAL IMAGING IN THE TEACHING OF PEDIATRIC SURGERY

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THE AIM OF THE STUDY

This cross-sectional study aimed at assessing participants' feedback on 3D models in teaching hydrocephalus, pectus excavatum, multiple organ injuries, hepatic tumour and vascular malformation treatment.

METHODS

A total of 50 students attending facultative pediatric surgical classes were asked to complete Likert questionnaires assessing the accuracy of the simulation, anatomical similarity, value as a training tool, usefulness, degree of complexity and value of inclusion into surgical training programs. The students were also asked to devise and plan surgical treatment based on the models. The 3D models have been created with Bodyviz and Osirix software. Bodyviz images included 3D stereoscopic objects.

MAIN RESULTS

The study group consisted of 20 - 5th year students, eight - 4th year, twelve - 6th year and ten - 3rd year students. Male to female ratio was 15 : 35. Most valued 3D models were pectus excavatum, multiple organ injuries and hepatic tumour examples. The least valued examples were vascular malformation patients. For study purposes, Bodyviz models were mostly valued by the students, but 3D Osirix objects were chosen when the students were asked to plan the surgery ($p < 0.05$). 90% of students would like to incorporate 3D models into their curriculum. 70% of respondents reported that models were accurate. All of the respondents would like to see more 3D printed models.

CONCLUSIONS

3D models of surgical anatomy and pathology are useful in the teaching of pediatric surgery and allow students to understand patient's complex anatomy and its spatial relationships.

PW7BS07: CAMERAWORK AND PERFORMANCE IN LAPAROSCOPIC SURGERY - PRELIMINARY RESULTS OF A PILOT STUDY

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INTRODUCTION

The aim was to evaluate the performance of laparoscopic procedures and the influence of either static or flexible camerawork. We sampled results with a LapSIM trainer and eye-tracking glasses.

METHODS

Surgeons (n=3) performed a laparoscopic knotting task on a LapSIM simulator. Each participant performed the task 12 times in total, six trials with a static camera view (sC) and the other six with a camera operated by a second person (oC). The camera conditions were counterbalanced across trials. Performance variables were completion time in seconds and the economy of movements in path length and angular pathway. Gaze behavior was measured with eye-tracking glasses.

RESULTS

Performance parameters were consistently lower in the group of sC. Participants spent significantly less time fixating on the main target area in sC than in oC, but spent significantly more time fixating on instruments with sC (Figure 1). The longer participants fixated the target area, the shorter was the knotting time, path length, and angular pathway. The detrimental effect of maladaptive attention was only visible in sC, but not in oC condition.

DISCUSSION

Using sC seems to be suboptimal for performance and gaze behavior. A skilled camera operator can potentially eliminate performance-harming effects of maladaptive visual behavior and promote optimal visual behavior of a surgeon. Our pilot data indicate that the match in terms of experience and gaze behavior in surgeon and camera operator may result in better performance. Further studies will be needed to clarify our preliminary results.

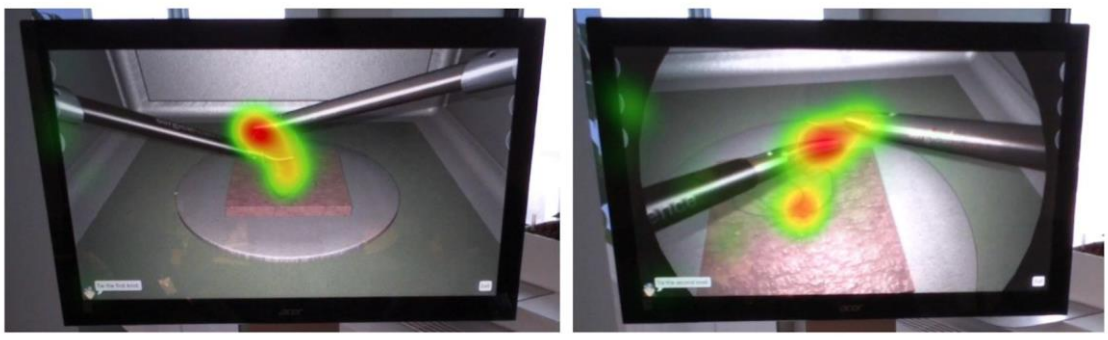

Figure 1: Heat maps for static camera (sC, left) and a second person camera work (oC, right). Even though the instruments and camera (and thus the AOIs) were moving during the task, the presented visual behavior is consistently mapped onto the given AOIs, i.e. the heat map reflects the proportion of dwell time spent on each AOI over the whole task.

PW7BS08: CD90- AND CD34 POSITIVE CELLS FROM HEPATOBLASTOMA CELL LINES EXPRESS STEM-CELL MARKERS OCT4 AND NANOG

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Dept. Pediatric Surgery and Urology, University Hospital Frankfurt, Frankfurt, Germany

AIM OF STUDY
Hepatoblastoma ist the most common liver tumor in children. In previous studies hepatoblastoma cells were found which expressed stem cell markers CD34 and CD90.
To investigate functional stem cell marker expression in hepatoblastoma cell lines.

METHODS
Hepatoblastoma cell lines (HUh6 and HepG2) were analysed for the expression of stem cell marker CD34, CD90 and OV-6 by FACS. A MAC-sorting was used to enrich CD90- positive hepatoblastoma cells. Cells were cultured in a spheric culture model and marker expression was analyzed over three passages for the expression of nuclear proteins Oct4 and Nanog as well as SNAIL1, TWIST1, Vimentin and N-CADHERIN by real-time PCR analysis. Cell migration was analyzed using a transwell culture system.

MAIN RESULTS
CD90-positive cells derived from Huh6 and HepG2 cell line showed co-expression of CD34 and Oval cell marker OV-6. Moreover, the stem cell nuclear proteins Oct4 and Nanog were highly expressed over several culture passages. In addition, cultured cells also highly expressed SNAIL1, TWIST1, Vimentin and N-CADHERIN, which are important signal molecules for epithelial to mesenchymal transition.

CONCLUSIONS
CD90 positive cells of human hepatoblastoma cell lines Huh6 and HepG2 show a high co-expression of other stem cell markers, as well as signal proteins important for cell stemness and the ability of epithelial to mesenchymal transition. The data indicate the presence of stem-like cell in hepatoblastoma cell lines which may be interesting for further studies aimed to investigate the origin and pathogenesis of hepatoblastoma in vitro.

PW7BS09: MOLECULAR MARKERS OF HYPOXIA IN EXPERIMENTAL INTRA-ABDOMINAL HYPERTENSION

Olga Morozova, Dmitry Morozov, Lubov Severgina, Larisa Maltseva, Maxim Ayrapetyan
Sechenov University, Moscow, Russian Federation

AIM OF THE STUDY

To investigate the concentrations HIF, VEGF-C, sVEGF-R1 in renal homogenate and serum in intra-abdominal hypertension (IAH) in newborn rats.

METHODS

75 newborn rats were randomized into five groups. Group 1 served as control [mean intra-abdominal pressure (IAP), 2 mm Hg]. Groups 2 and 3 were subjected to mild IAH (mean IAP, 9 mm Hg), while 4 and 5 were subjected to severe IAH (mean IAP, 17 mm Hg). Duration of IAH was 5 and 10 days respectively. IAH was created by intraperitoneal injection of collagen under control of intravesical manometry. Concentrations of HIF, VEGF-C, sVEGF-R1 were measured by ELISA. Renal histology was evaluated by light microscopy. The experiment was approved by the local research ethics committee.

RESULTS

HIF concentration in renal homogenate was higher in 2, 3, and 4 groups than in control ($p<0.001$), but it was reduced in serum in all groups ($p <0.05$). VEGF-C concentration in renal homogenate was higher in 2, and 4 groups than in control ($p <0.001$), it was increased in serum in group 3 ($p = 0.013$). The level of sVEGF-R1 of renal homogenate was higher in 2 and 4 groups than in control ($p <0.05$), but sVEGF-R1 was increased in serum in 3 groups ($p = 0.022$). Histology shows dilation of the glomerular urinary space, hydropic degeneration of the epithelium of the proximal tubules.

CONCLUSION

Changes of concentrations biomarkers of hypoxia (HIF, VEGF-C и sVEGF-R1) in renal homogenate and morphological signs depended on the severity and duration of IAH.

PW7BS10: DIRECT SKELETAL MUSCLE DIFFERENTIATION OF HUMAN AMNIOTIC FLUID STEM CELLS FOR ENGINEERING AUTOLOGOUS TISSUE IN FOETUSES AFFECTED BY CONGENITAL DISEASES

Giulia Selmin[1], Mattia Francesco Maria Gerli[1], Francesco Saverio Tedesco[2], Giulio Cossu[3], Nicola Elvassore[1], Paolo De Coppi[1]

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AIM OF THE STUDY

Human amniotic fluid stem cells (hAFSCs) are patient-specific mesenchymal stem cells that can be safely isolated during gestation. These cells show broad multi-lineage differentiation ability and their use has limited ethical and safety burdens. hAFSCs could therefore potentially be employed to develop cell-based regenerative medicine strategies in an autologous setting. Success in efficiently converting hAFSCs to myogenic cells would allow their use in fetuses with congenital skeletal muscle disorders.

METHODS

Human AFSCs were collected through a Bio-bank. The focus of this work is therefore the derivation of skeletal muscle cells from hAFSCs through the forced expression of the myogenic master regulator MyoD.

MAIN RESULTS

hAFSCs have spontaneous myogenic potential upon co-culture with differentiating myoblasts. Moreover, hAFSCs underwent successful direct differentiation experiments using an inducible lentiviral MyoD construct. In particular, hAFSCs could undergo high efficiency myogenic conversion and form multinucleated myotubes. Our efforts are now focusing on making this strategy more clinically relevant, avoiding the use of viral vectors and eliminating the risk of insertional mutagenesis. For this purpose we are adopting a non-integrating modified mRNA MyoD expression strategy to induce myogenic conversion of our hAFSCs.

CONCLUSION

In combination with an ad-hoc designed microfluidic device, we will be able to increase the efficiency of the procedure making it scalable and cost-effective. The ability to efficiently differentiate hAFSCs to skeletal muscle opens the potential of using these cells for therapy in fetuses affected by large muscle congenital defects.

PW7BS11: IN A MODEL FOR REPLACEMENT OF ESOPHAGUS IN GROWING PIGS, ABSENCE OF STENT MIGRATION DID NOT IMPROVE THE REMODELLING

Anders Sandin[1], Linus Jönsson[1], Vladimir Gatzinsky[1], Eva Jennishe[2], Olof Holmquist[1], Michaela Dellenmark Blom[1], Erik Axman[1], Kate Abrahamsson[1]
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AIM OF THE STUDY

In studies of replacement of esophagus, it has been found to be important that an inert stent is present to maintain the lumen during tissue healing. In our model where we replace part of the intrathoracical esophagus with biomatrix, we have had problems with stent migration. Therefore the shape and properties of the stent was modified in order to avoid detachment of the stent before 35 days.

METHOD

Three cm circumferential esophagus of 9 growing piglets was replaced with biomatrix, (Biodesign ®). The biomatrix was held in place with silicone tubes, metal stents, degradable stents and large special stents with increasing diameters. The tissue was analyzed 35 days after surgery with a focus on inflammatory image, re-formation of muscle cells and mucosal overgrowth.

MAIN RESULTS

After 26-35 days, the stent had migrated prematurely on 7 animals. 2 of the animals had stent in place in the healing area after 35 days post implantation. It turned out that the histological image of the animals that had had a stent in place had an impaired inflammatory response compared to our previous studies where the animals were allowed to live 20 days. The Biomatrix had been completely consumed.

CONCLUSION

Although the tissue healing had been going on for a longer time with sustained lumen, the quality of the tissue was poorer. Biomaterial consumption seems to lead the inflammatory response turning to poorer remodelling.

We are now planning to have the biomaterial remain longer or add new material in future studies

PW7BS12: OPTIONS OF THE SINGLE-LAYER CONTINUOUS SUTURE IN COLONIC ANASTOMOSES IN THE RABBIT MODEL

Dmitry Morozov, Maxim Ayrapetyan, Alexey Fayzullin, Anna Malashchenkova
Sechenov University, Moscow, Russian Federation

AIM OF THE STUDY

Study the safety and healing characteristics of a single-row continuous suture in colonic anastomoses in an experiment.

METHODS

48 rabbits were randomly divided into 2 experimental groups. All animals were formation of a colonic anastomosis of the type "end to end". The first group (n=24) - single row continuous blanket sero-musculo-submucosal suture, the second group (n=24) - similar suture through all layers of the intestinal wall. Each group was divided into two subgroups on the use of suture material with and without antibacterial coating. Macroscopic and histological assessment of the anastomosis zone was carried out on 3,7,14 and 21 days. The restoration of intestinal motility, D. Evans' model, method of T.Ihrvin, the results of standard histological examination and wound healing scale were analyzed.

RESULTS

The most pronounced infiltrative adhesion process in the anastomosis zone was observed in the subgroup, where the suture was made through all layers with a thread without antibacterial coating. The indices of stenosis index in the subgroups of Group I (9,8±1,6 and 15,4±1,9) were 2-4 times less ($p<0.05$) than in the Group II (21,1±2,9 and 36,2±3,5). According to the histological examination, when the precision technique is performed, complete restoration of the wall structure of the colon is noted.

CONCLUSION

The using of a single-row continuous suture on the large intestine allowed to minimize the number of postoperative complications, and the using of a filament with an antibacterial coating demonstrated the smallest inflammatory response in the zone of the formed anastomosis.

PW8GE01: BIANCHI ORCHIDOPEXY VERSUS THE INGUINAL APPROACH IN CHILDREN WITH PALPABLE UNDESCENDED TESTIS

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Tunis Children's Hospital, Tunis, Tunisia

AIM OF THE STUDY

We performed this study to compare the efficacy and safety between single-incision, transscrotal orchidopexy, and the traditional inguinal orchidopexy in children

METHODS

470 children with palpable undescended testis were treated from January 2009 to January 2014, 34 (42 testes) by Bianchi Orchidopexy and the other 436 by the traditional method of inguinal incision (519 testes). Comparisons were made in the postoperative complications between the two surgical strategies. Fisher's exact test was used for statistical analysis.

MAIN RESULTS

The mean operation time was significantly shorter in the Bianchi orchidopexy group than in the other group. During the 1—2 years of follow-up .We have noted 17 cases of testicular atrophy in the inguinal orchidopexy group. Testis retraction was observed in 15 cases in the Bianchi orchidopexy group as compared with 5 in the other group (P>0.05). A postoperative hematoma was observed in one case in the Bianchi group versus 19 cases in the other group. Postoperative infection was only observed in 10 patients who had an orchidopexy according to the inguinal technique.

CONCLUSIONS

Compared with Inguinal orchidopexy, Bianchi orchidopexy has a lot of advantage in terms of operation time, postoperative infection and hematoma. However, the incidence of testis retraction was much higher in patients who had an orchidopexy according to the Bianchi technique

Should we considered the Bianchi orchidopexy as an effective surgical approach alternative to inguinal orchidopexy for pediatric undescended

PW8GE02: A SYSTEMATIC REVIEW AND META-ANALYSIS OF VIRTUAL REALITY IN PEDIATRICS: EFFECTS ON PAIN AND ANXIETY

Robin Eijlers[1], Elisabeth Utens[1], Lonneke Staals[2], Pieter de Nijs[1], Johan Berghmans[3], René Wijnen[4], Manon Hillegers[1], Bram Dierckx[1], Jeroen Legerstee[1]
[1]Department of Child and Adolescent Psychiatry/Psychology, Erasmus MC-Sophia Children's Hospital, Rotterdam, Netherlands. [2]Department of Anesthesiology, Erasmus MC-Sophia Children's Hospital, Rotterdam, Netherlands. [3]Department of Anesthesia, ZNA Middelheim, Queen Paola Children's Hospital, Antwerp, Belgium. [4]Intensive Care and Department of Pediatric Surgery, Erasmus MC-Sophia Children's Hospital, Rotterdam, Netherlands

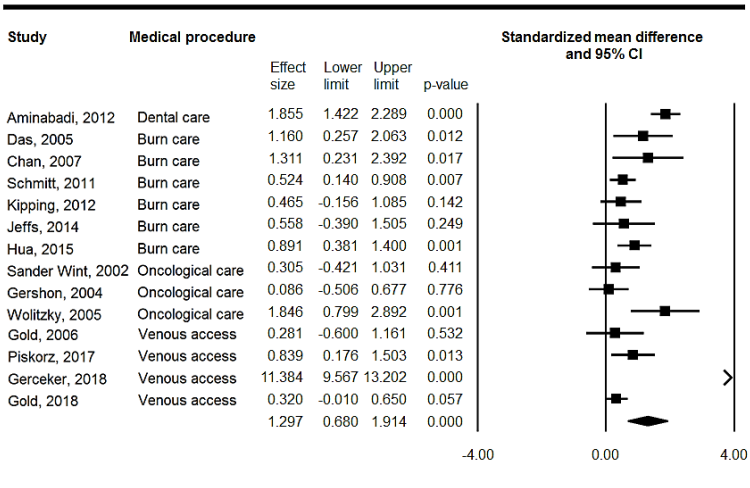
AIM OF THE STUDY
Medical procedures often evoke pain and anxiety in pediatric patients. The aim of this systematic review and meta-analysis is to collate evidence on the effect of virtual reality (VR) on reducing pain and anxiety in pediatric patients undergoing medical procedures.

METHODS
On April 25, 2018, we searched electronic databases for studies that applied VR in a somatic setting, with participants aged 21 years and younger. Outcomes were pain and anxiety during a medical procedure. Data were analyzed using a random-effects model and were expressed as standardized mean difference (SMD) between VR and standard care conditions with 95% confidence interval (CI).

MAIN RESULTS
Seventeen studies of the identified 2,889 citations were included. VR was applied as distraction (*n*=16) during venous access, dental, burn, or oncological care, or as preparation (*n*=1) before elective surgery. VR was associated with lower self-reported pain (SMD=1.30, 95% CI=0.68–1.91, *p*<0.001) (Figure 1) and anxiety levels (SMD=1.32, 95% CI=0.21–2.44, *p*=0.020). The effect of VR on pediatric pain was also significant when observed by caregivers (SMD=2.08, 95% CI=0.55–3.61, *p=0.008*) or professionals (SMD=3.02, 95% CI=0.79–2.25, *p*=0.008). For anxiety, limited observer data were available.

CONCLUSIONS
VR research in pediatrics has mainly focused on distraction. Large effect sizes indicate that VR is an effective distraction intervention to reduce pain and anxiety in pediatric patients undergoing a wide variety of medical procedures. However, research on the effect of VR as preparation tool for medical procedures is scarce.

Figure 1. Random-effects meta-analysis for the effect of virtual reality on patient-reported pain during a medical procedure, compared to standard care



PW8GE03: ASSESSMENT OF NEUROGENIC BOWEL SYMPTOMS WITH THE BOWEL DYSFUNCTION SCORE IN CHILDREN WITH SPINA BIFIDA: A PROSPECTIVE CASE CONTROL STUDY

Claire Gibbons[1], David Coyle[2], Christopher White[3], Miriam Doyle[1], Emer Aldridge[1], Salvatore Cascio[1]
[1]Temple Street Children's Hospital, Dublin, Ireland. [2]Nationwide Children's Hospital, Columbus, Ohio, USA. [3]Our Lady of Lourdes Hospital, Drogheda, Ireland

AIM
To compare the quality of life (QoL) in children with spina bifida with a control group of their peers using a validated questionnaire, the Neurogenic Bowel Dysfunction Score (NBDS).

METHODS
The NBDS questionnaire was prospectively distributed to children attending a multidisciplinary Spina Bifida clinic and healthy controls attending paediatric urology clinics. A score (out of 41) was assigned to each child based on their responses to the validated questionnaire. A lower score indicates better bowel function-related quality of life. SPSS software (v.25) was used for all statistical analysis.

RESULT
There were 100 respondents to the questionnaire, 50 children with spina bifida and 50 controls. The average age of respondents was 7.88 years (3 years -16 years). Of those with Spina Bifida, 33 (66%) were on retrograde rectal irrigations (19 [57%] Peristeen system, 10 [30%] tube rectal irrigations, 4 [13%] Willis system), 6 (12%) were on laxatives, and 9 (18%) were on no treatment. The mean NBDS for Spina Bifida patients was significantly higher 14.72 (SD 6.081) compared to the control group 3.54 (SD 4.127, $p<0.05$). Amongst Spina Bifida patients, there was no difference in quality of life between the modalities of bowel management ($p=0.395$).

CONCLUSION
Despite active bowel management, children with spina bifida report a worse quality of life compared to the control group. In those with spina bifida, the lack of a difference between various bowel management strategies, including no treatment, indicates the need for a longitudinal study to evaluate the basis for this unexpected finding.

PW8GE04: OPEN VERSUS LAPAROSCOPIC APROACH FOR APPENDECTOMY: DOES THE RESIDENT EXPERIENCE MATTER?

Antonio Jesús Muñoz-Serrano, Carlos Delgado-Miguel, Karla Estefanía, María Álvarez, Vanessa Núñez, Javier Serradilla, Saturnino Barrena, Leopoldo Martínez, Manuel López Santamaría
Hospital Universitario La Paz, Madrid, Spain

Abstract

Aim of Study: Appendectomy is one of the most common procedures used by Pediatric surgeons. So, it is one of the first procedures performed by residents as a main surgeon in university hospitals. Our aim is to describe the influence of the resident experience on appendectomy outcomes.

Methods: A retrospective study of appendectomies between 2017-2018 was performed. We classified patients depending on the rank of the surgeon: first year resident (R1); second (R2); third (R3); forth (R4) and fifth year (R5) or pediatric surgery specialist. We analyzed clinical variables, type of appendicitis, length of hospital stay, surgery time, complications and surgical approach.

Main results: Five hundred and ninety two patients were included. 98.4% of appendectomies were performed by residents in our institution without any differences in the distribution of complicated appendicitis in the groups (p=0.06). There weren't significant differences in the mean surgery time (43±18 to 48±22minutes;p=0.21) nor the postoperative complications (8.1% to 16.4%; p=0.28); with a similar length of hospital stay (3.4±3.1 to 4.0±3.5 days; p=0.56). There were significant differences in the proportion of laparoscopic surgery depending on the year of resident, with an increase of 28.9% from R2 to R5 (16.3%vs.45.2%; p<0.01) without any differences in the conversion rate to open approach (p=0.85).

Conclusions: The year of resident doesn't influence the outcomes of appendectomies as long as there is a suitable supervision. It reinforces the need of involving the resident since the first years of surgical training both in open and laparoscopic surgery.

	R1	R2	R3	R4	R5	Specialist	Total
Appendectomy							
n	45	208	158	99	73	9	592
%	7.6	35.1	26.7	16.7	12.3	1.6	100

	R2		R3		R4		R5		p
	n	%	*n*	%	*n*	%	*N*	%	
Appendectomy	208	38.7	158	29.4	99	18.4	73	13.5	-
Surgical approach									
Open	174	83.7	110	69.6	60	60.6	40	54.8	**p=0.01**
Laparoscopic	34	16.3	48	30.4	39	39.4	33	45.2	
Intraoperative diagnosis									
No appendicitis	3	1.4	2	1.3	3	3.0	1	1.4	
Phlegmonous	121	58.2	94	59.5	60	60.6	39	53.4	*p=0.06*
Gangrenous	57	27.4	35	22.2	25	25.3	25	34.2	
Peritonitis	27	13.0	19	12.0	11	11.1	6	8.2	
Appendicular plastron	0	0.0	8	5.1	0	0.0	2	2.7	
Complications									
Global	23	11.1	14	8.9	8	8.1	12	16.4	*p=0.28*
Intra-abdominal abscess	13	6.3	7	4.4	3	3.0	6	8.2	*p=0.41*
Wound infection	9	4.3	9	5.7	4	4.0	4	5.5	*p=0.90*
Wound dehiscence	4	1.9	4	2.5	3	3.0	4	5.5	*p=0.46*
Paralytic ileus	1	0.5	2	1.3	0	0.0	2	2.7	*p=0.24*
Bowel obstruction	3	1.4	0	0.0	0	0.0	1	0.7	*p=0.30*
Reconversion to open approach	1	2.9	2	4.7	1	2.6	2	6.5	*p=0.85*
Yes	33	97.1	41	95.3	37	97.4	29	93.5	
No									

	R2	R3	R4	R5	p
	Mean	Mean	Mean	Mean	
Length of hospital stay (days)	3.40 ± 3.07	3.52 ± 2.93	3.45 ± 2.67	4.04 ± 3.53	*p=0.56*
Surgical time (minutes)	48.10±19.04	47.16±19.01	43.73±18.31	48.21±22.86	*p=0.21*

PW8GE05: PARENTAL ONLINE HEALTH INFORMATION SEEKING BEHAVIOUR IN MAJOR ELECTIVE, MINOR ELECTIVE AND EMERGENCY PEDIATRIC SURGICAL SITUATIONS

Shi Min Wong[1], Kenneth PL Wong[2], Rui Xian Lim[3], Mark IL Angus[2], Yong Chen[2], Candy SC Choo[2], Shireen Anne Nah[2]
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Abstract
Aim
Accessing the Internet for health information has increased exponentially. We evaluate the online health information(OHI) seeking behaviour of parents with children undergoing major elective(MajEl) surgical procedures, comparing them to our previously published study on minor elective(MinEl) and emergency(Em) situations.
Methods
We prospectively surveyed parents of children admitted to our institution for major elective operations between November 2017-November 2018, using convenience sampling. Each respondent completed an anonymized modification of a previously published survey, comprising 20 questions on Internet usage. We compared responses to our previous study comprising 50 MinEl and 34 Em cases. Chi-squared tests were used for categorical data, with $p<0.05$ considered significant. Institutional approval was obtained.
Results
We approached 109 parents, of whom 91 responded. Majority were mothers (n=63,69.2%). All had home Internet, with 84(92.3%) accessing it daily. However, only 70(76.9%) sought OHI regarding their child's condition. Of these, 64(91.4%) agreed that online information was similar to their doctor's. Most common sources were general health(50.0%) and hospital(44.1%) websites. MajEl group parents were more likely to obtain information from their general practitioner compared to MinEl and Em groups($p=0.02$) and less likely to ask family/friends($p<0.0001$)(Table). Reasons for seeking OHI also differed, with MajEl parents more likely to search for non-surgical treatments($p<0.003$) and long-term outcomes($p<0.0001$).
Conclusions
The Internet proves to be a trusted, convenient and valuable resource to parents. Surgeons should note this when counselling and delivering content to parents.

Table: Responses to questions on alternative information sources and reasons for internet usage

Question		Major elective (n=91)	Minor elective (n=50)	Emergency (n=34)	p-value
What other information resources did you use? (n, %)	General Practitioner/Family doctor	58 (63.7)	21 (42.0)	15 (44.1)	P=0.02*
	Friends/Family	27 (29.7)	27 (54.0)	24 (70.6)	P<0.0001*
	TV/radio/Media	3 (3.3)	21 (42.0)	13 (38.2)	P<0.0001*
	Print materials	11 (12.1)	10 (20.0)	9 (26.5)	P=0.14
	Other health workers	11 (12.1)	12 (24.0)	7 (20.6)	P=0.17
		Major elective (n=70)#	Minor elective (n=38) #	Emergency (n=24) #	p-value
What were you aiming to learn about your child's condition from the internet (n, %)	Alternative diagnoses	33 (47.1)	18 (47.4)	15 (62.5)	P=0.40
	Non-surgical treatment	35 (50.0)	31 (81.6)	17 (70.8)	P=0.003*
	Long-term outcome	48 (68.6)	15 (39.5)	6 (25.0)	P<0.0001*
	Complications of surgery	6 (8.6)	1 (2.6)	2 (8.3)	P=0.48

* statistically significant

only those who accessed the internet for their child's condition were included

PW8GE06: IS TRAINING IN ONE OR TWO DAY COURSES FOR HIGH COMPLEX, LOW VOLUME, MINIMAL INVASIVE PEDIATRIC SURGERY SKILLS GOOD ENOUGH?

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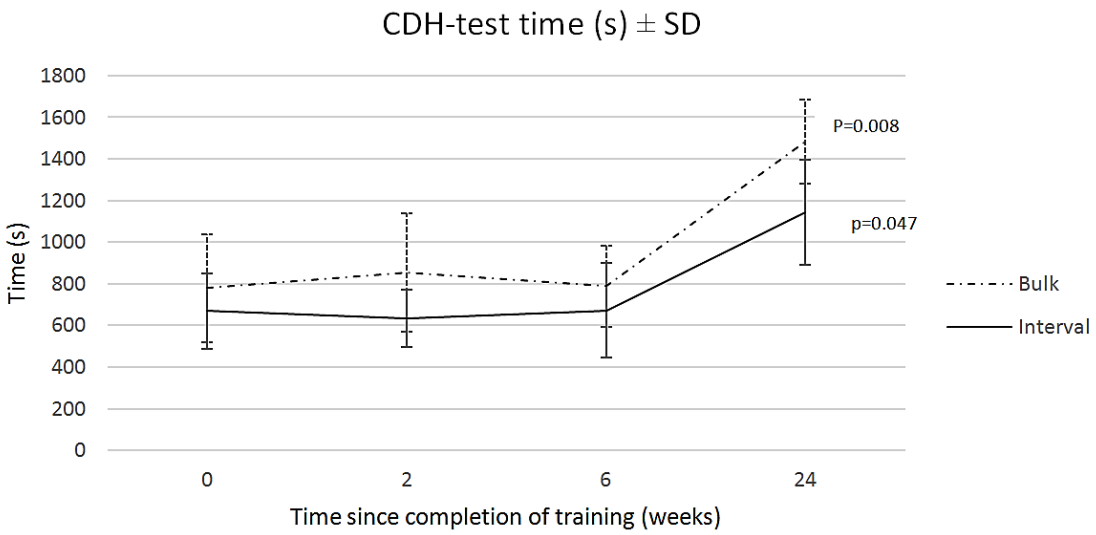
AIM
Current training programs for complex minimal invasive pediatric surgery are one/two day events. The aim of this study was to examine the effects of bulk training versus interval training on the preservation of high complex low volume minimal invasive pediatric surgery skills.

METHOD
Medical students, without prior experience, were randomly assigned to either a bulk or interval training program for congenital diaphragmatic hernia (CDH) and esophageal atresia (EA) repair. Both groups trained five hours; the bulk group twice within two-three days and the interval five times within two weeks. Skill retention was assessed two weeks, six weeks and six months post-training.

RESULTS
Eighteen students participated in the study (bulk n=10, interval n=8). The mean time needed to complete the procedure increased for both procedures, although most in the bulk group and for CDH repair (p=0.008, Figure 1). The accuracy in suturing (mean distance to target in EA) reduced tremendously in the bulk training (4.3mm at training endpoint to 6.9mm at six weeks), whereas interval training improved from 2.9 to 2.1mm after six weeks. Mean suture gap distances in EA increased for both groups eventually, but more and earlier for bulk training (0.9mm to 13.3mm compared to 0.3mm to 6.8mm), the interval group was significantly better at six weeks post training (2.1 versus 6.9mm, p<0.001).

Conclusion
This study suggest superior skill retention of complex pediatric MIS skills for interval training over one/two day courses. However, after 6 months both groups scored significantly worse indicating the need for continuous practice.



PW8GE07: WHAT DOES THE VERTEBRAL PATTERN IN CHILDREN BORN WITH AN ESOPHAGEAL ATRESIA AND/OR ANORECTAL MALFORMATION TELL US?

Pauline Schut[1], Alex Eggink[1], Margo Boersma[1], Dick Tibboel[2], René Wijnen[2], Erwin Brosens[1], Marjolein Dremmen[2], Titia Cohen-Overbeek[1]
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Abstract

The standard of care for patients with esophageal atresia and/or anorectal malformation involves screening for VACTERL-association, including assessment of the vertebral column.
Aim of the study: To assess the vertebral pattern in children with an esophageal atresia and/or anorectal malformation and determine whether the severity of an abnormal vertebral pattern is associated with the presence of other structural, chromosomal or genetic anomalies.
Methods: Retrospective cohort study. The vertebral pattern of children born between 2006 and 2017, and diagnosed with an esophageal atresia (n=135), anorectal malformation (n=215) or both (n=17), was assessed on radiographs.
Main results: The vertebral pattern of 202 children could be assessed. It was normal in 32/202 cases (15.8%). The most frequent abnormality was a cervicothoracic boundary abnormality (65/202; 32.2%). The cervical region of 335 children could be assessed. Cervical ribs were present in 147 patients (43.9%). The prevalence was highest in children born with both an esophageal atresia and anorectal malformation (9/17, 52.9%); in children with an esophageal atresia it was 48.9% (66/133, 48.9%); in those with an anorectal malformation 33.5% (72/185). The higher the number of associated structural abnormalities, the higher the prevalence of severe vertebral pattern abnormalities. Cervical vertebral pattern abnormalities were particularly common in children with chromosomal and genetic abnormalities (18/20, 90.0%).
Conclusions: Abnormal vertebral patterns and cervical ribs were frequent in the children included in this study and these were more severe in the presence of associated anomalies. These findings could be of added value in determining the neonatal prognosis.

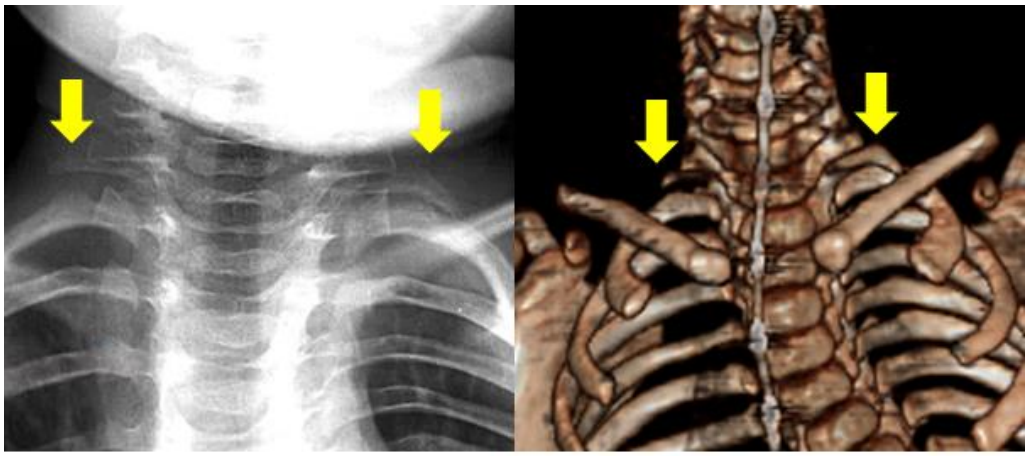

Fig 1. Radiograph (left) and 3-dimensional reconstruction of Computed Tomography image (right) showing bilateral rudimentary cervical ribs (arrows) in an infant born with an esophageal atresia.

PW8GE08: THE INFLUENCE OF CONTEXTUAL INFORMATION DECISION-MAKING BY DOCTORS

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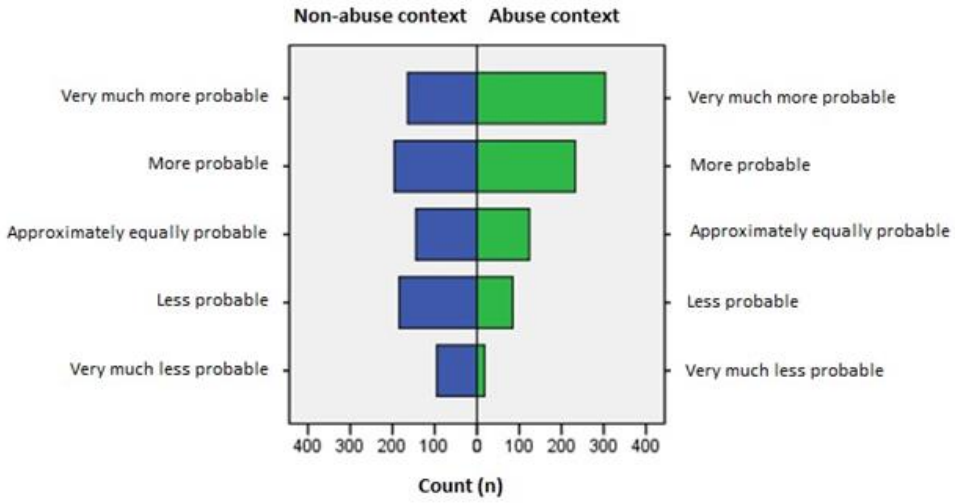
Abstract

Aim The majority of paediatric femur fractures result from accidental trauma, however it is important to consider non-accidental trauma, especially in pre-ambulatory children. We study whether contextual information subconciously biases conclusions of health-care professionals with respect to whether observations provide evidence for child abuse or not.

Methods An electronic survey with nine radiographs of femur shaft fractures was designed. For each case two different vignettes with contextual information were designed (non-abuse vs. abuse context). One of both vignettes was randomly assigned to the radiograph shown to the participant, followed by a question with a 5-point answer scale, which represents a verbal expression of the likelihood ratio of the fracture regarding a non-accidental versus accidental cause. Participants were staff members and residents of different specialisms of several hospitals.

Results In total 172 participants responded. There was a significant effect of influence by contextual information between the non-abuse context (mean 0.19 ± 1.3) versus the abuse context (mean 0.94 ± 1.1; $p < 0.001$); participants reported stronger evidential strength towards a non-accidental cause of the fracture when they were assigned to an abuse vignette. Experience in years of practice and current function or specialty did not protect the participant from being influenced.

Conclusions Health-care professionals are subconciously biased by contextual information with respect to whether observations provide evidence for a non-accidental trauma or not, regardless of their expertise level or function. It is important to prevent contextual bias as much as possible with the recognition of its existence as a first step in this process.



PW8GE09: COST-MINIMIZATION ANALYSIS OF ANTIBIOTIC TREATMENT IN NON-COMPLICATED ACUTE APPENDICITIS IN CHILDREN

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AIM OF THE STUDY
Acute appendicitis (AA) is the most frequent urgent surgical pathology in childhood and associates important healthcare burden and costs. In 2018, our service implemented a new AA management protocol, modifying both the antibiotic and the days of treatment. We aim to compare the effectiveness and cost of the new protocol with the previous one.

METHODS
A cost-minimization study was performed in patients with uncomplicated AA during 2017-2018. They were divided into two groups according to the antibiotic protocol: A (single presurgical amoxicillin-clavulanic acid dose in phlegmonous, and 5 days in gangrenous) and B (Metronidazole and Gentamicin 24 hours in phlegmonous and 7 days in gangrenous). Demographic variables, average hospital stay and postoperative complications were analyzed. The effectiveness was evaluated by the postoperative complication rate. Costs were determined by data provided by the Analytical Accounting service.

MAIN RESULTS
A total of 495 patients were included (155 protocol A and 340 protocol B). Protocol A decreased the hospital stay in phlegmonous AA (1.3±0.8 *vs* 2.1±0.8, p<0.001) and gangrenous (3.8±6.3 *vs* 5.2±2.1; p<0.001), without differences in the rate of postoperative complications between both groups (7.1% *vs* 7.6%, p=0.83). Protocol A showed a reduction in the total cost per patient of 1,235.1€ in phlegmonous and 2,161.4€ in gangrenous AA.

CONCLUSIONS
The application of the new antibiotic protocol with amoxicillin-clavulanic acid in the treatment of AA is a cost-efficient option, which allows to reduce the hospital stay and the associated costs, without increasing the rate of complications.

PW8GE10: THE CURRENT MANAGEMENT OF RECURRENT INTUSSUSCEPTION. A SYSTEMATIC REVIEW

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INTRODUCTION
While the management in initial idiopathic intussusception is largely accepted, the management of recurrent intussusception (RI) is still controversial. Aim was to review the international literature in order to evaluate the actual incidence of recurrence after primary intussusception, to determine the rates of surgical intervention and pathological leading point and, at least, to define a most appropriate management for children with recurrent intussusception.

METHODS
English-language literature was collected from 1990 to 2018 using the keywords “recurrent intussusception” or “recurrence” and “intussusception”, excluding cases reports, papers with adult or mixed cases, ileo-ileal or colo-colic intussusception, metanalysis studies or papers with unclear or replaced data. Data were valuated using mean ± standard deviation.

RESULTS
335 papers were collected from Pubmed and 17 were considered suitable for the study. On 18868 patients affected by intussusception, 1033 RI were recorded (9.1%). The average of episodes was 1.46 for each case. The number of attempts of not-surgical reduction ranged from 3 to 10 (5.23±2.13). 14.8% of RI underwent surgery and a PLP was found in 5.0% of patients. In particular, 24.2% of PLP were benign polyps, 21.15% had a Meckel’s diverticulum and 17.31% had an intestinal duplications.

DISCUSSION
Our review suggests that the repeated reduction attempts of RI could be considered an efficient and safe procedure. The incidence of PLP in RI does not seem exceeding the one of the first episode and does not justify a surgical procedure. When not contraindicated, in RI the same algorithm of primary intussusception should be applied.

PW8GE11: FETOSCOPIC REPAIR OF MYELOMENINGOCELE: PRELIMINARY RESULTS FROM A SINGLE CENTER

Francesco Macchini[1], Nicola Persico[2], Isabella Fabietti[2], Simona Boito[2], Giuliana Anna Porro[3], Anna Morandi[1], Martina Ichino[1], Giorgio Carrabba[4], Fabio Mosca[5], Enrico Ferrazzi[2], Gian Antonio Manzoni[6], Denise Lapa Pedreira[7], Ernesto Leva[1]

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AIM OF THE STUDY

to describe the preliminary results of fetoscopic treatment of open spina bifida (OSB) in our Center.

METHODS

After observership at Albert Einstein Hospital Israelita in San Paolo a multidisciplinary team was created in our Center. Since June 2018 patients with prenatal diagnosis of isolated OSB with lesions from T1 to S1 and hindbrain herniation, were offered fetoscopic treatment. The surgical repair was planned between 24 and 29 weeks. Four trocars were introduced in the amniotic cavity under ultrasound guidance. Trocar position changed according to that of placenta. Warm CO2 insufflation was performed (average 14mmHg, range 10-18). The neural placode was released and covered by a biocellulose patch, when the defect was too large two patches were used (bilaminar skin substitute and biocellulose patch). When primary closure was feasible the skin was closed over the patch. After birth, the bilaminar patch was protected with a dressing.

MAIN RESULTS

6 fetoscopic repairs of OSB were performed at a mean age of 28 weeks. 4 cases had posterior placenta: 2 had large defects requiring patch closure. In the 2 patients with anterior placenta primary closure was achieved. Post-operative course was uneventful. Patients were born at a mean gestational age of 34 (29-39). All patients are in a multidisciplinar follow-up protocol. Two ventriculo-peritoneal shunts were positioned and three patients had partial skin dehiscence requiring surgical revision.

Conclusions: fetoscopic repair of OSB is feasible. Prematurity still represents the main complication. Multidisciplinary long term follow-up is needed.

PW8GE12: ANXIETY LEVEL IN CHILDREN AFTER URGENT SURGERY

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AIM OF THE STUDY
To investigate level of anxiety in children after urgent surgery for appendicitis.

METHODS
42 consecutive children (23 females, 19 males) admitted for acute appendicitis were included. The second day after surgery, a visual analog scale for anxiety was administered and salivary samples for the assessment of cortisol were obtained at three time points in order to calculate the Area Under the Curve (AUC) for cortisol. Heart and respiratory rate, body temperature and skin conductance were measured. Parents and nurses evaluated levels of anxiety using the modified Yale Preoperative Anxiety Scale (m-YPAS), a behavioral observation score that consist of 27 items divided in five domains.

MAIN RESULTS
Mean age 10.95±2.45. Open appendectomy 61.9%, TULAA 38.1%. No significant differences between sexes in anxiety levels, AUC cortisol and heart and respiratory frequency. Females had slightly higher body temperature (36.5 vs 36.1, t=-2.34, p=0.02) and higher phasic skin conductance (11.70±6.87 vs 7.21±4.50, t=-2.44, p=0.02). Open appendectomy had higher operator-rated level of anxiety (15.85±3.39 vs 13.75±2.05, t=2.23, p=0.03), while no difference was detected when the child self-evaluated his/her level of anxiety. Parent-rated anxiety level was negatively related with age of the child (r=-0.38, p=0.02). Self-reported level of anxiety significantly related with AUC cortisol and only with level of “activity domain” rated by parents in m-YPAS score.

CONCLUSIONS
Child-rated anxiety is significantly correlated with cortisol AUC. Type of intervention does not influence child-rated anxiety levels; however, open surgery leads to higher parent-rated anxiety levels.

YI01: AMNIOTIC FLUID STEM CELL EXOSOMES PROMOTE LUNG MESENCHYMAL MATURATION IN EXPERIMENTAL CONGENITAL DIAPHRAGMATIC HERNIA

Louise Montalva[1,2], Areti Tzanetakis[1,2], Gabriele Raffler[1,2], Alexandra Tzanetakis[1,2], Lina Antounians[1,2], Augusto Zani[1,2]
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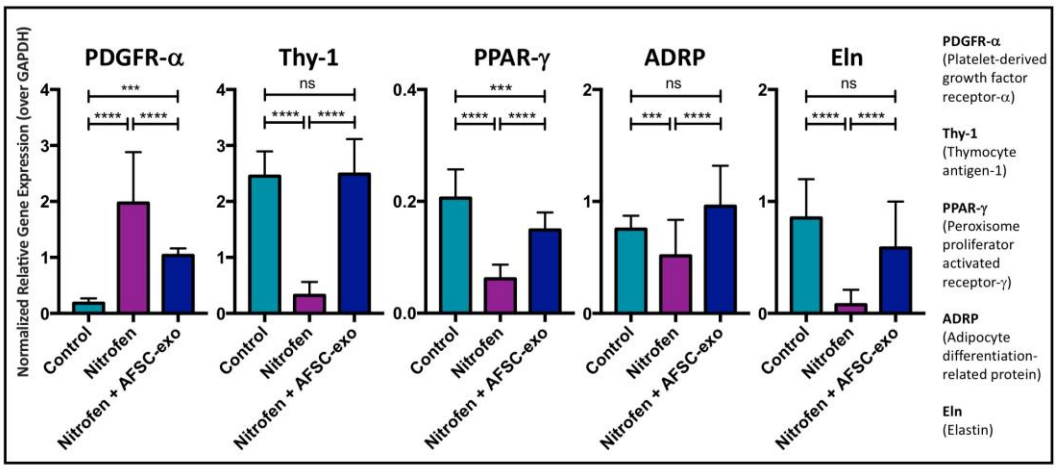
AIM OF THE STUDY
Pulmonary hypoplasia secondary to congenital diaphragmatic hernia (CDH) is characterized by immature epithelium and mesenchyme. We have previously shown that amniotic fluid stem cell derived exosomes (AFSC-exo) promote epithelial maturation via release of microRNAs. Herein, we aimed to investigate whether AFSC-exo administration could promote lung mesenchymal maturation via the differentiation of fibroblasts into lipofibroblasts in experimental CDH.

METHODS
AFSC-exo were isolated via ultra-centrifugation from AFSC conditioned medium and characterized according to the *International Society for Extracellular Vesicles* 2018 guidelines.
Fibroblasts were isolated via serial plating from rat lungs at embryonic (E) day 19.5 from dams treated with nitrofen or vehicle (control) at E9.5. Fibroblasts from nitrofen-exposed lungs were treated with medium alone or AFSC-exo for 24h. Mesenchymal maturation was studied by measuring markers of undifferentiated fibroblasts (PDGFR-a) and differentiated lipofibroblasts (Thy-1, PPAR-g, ADRP, Eln) via RT-qPCR. Groups were compared with one-way ANOVA (Tukey post-test). RNA sequencing on AFSC-exo cargo was conducted using NextSeq.

MAIN RESULTS
Compared to control, nitrofen-exposed lungs had more undifferentiated mesenchyme, measured by higher PDGFR-α expression, and lower Thy-1, PPAR-g, ADRP, and Eln levels [**Figure**]. AFSC-exo administration promoted mesenchymal differentiation by decreasing PDGFR-α levels and increasing Thy-1, PPAR-g, ADRP, and Eln expression. We identified 14 microRNAs in the AFSC-exo cargo that are potentially involved in fibroblast differentiation.

CONCLUSIONS
Administration of AFSC-exo promotes mesenchymal maturation of fetal hypoplastic lungs by stimulating lipofibroblast differentiation, which is essential for surfactant production and alveolarization. Exosome therapy is a promising avenue for CDH babies with pulmonary hypoplasia.



YI02: RISK FACTORS FOR CRYPTORCHIDISM AND TREATMENT DELAY: A NATIONWIDE COHORT STUDY

Erik Omling[1,2], Sanna Bergbrant[1], Andreas Persson[3,4], Jonas Björk[5,6], Lars Hagander[1,2]
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AIM OF THE STUDY
Early treatment for cryptorchidism reduces long-term complications. However, less than 10% of boys with cryptorchidism are treated before 1 year of age in Sweden. The aim of this study was to determine the cumulative incidence, and risk factors for disease and delayed treatment.

METHODS
All Swedish boys born 2001-2014 were identified and followed in longitudinal registers until surgery for cryptorchidism or end of study (median 6.4 years follow-up). Risk factors for disease were assessed in survival analysis, and cumulative incidences were calculated. Risk factors for delayed treatment were assessed with multivariable Cox regression, with inclusion of travel time measured in minutes, and multiple socioeconomic determinants. Ethical approval: 2014/791, 2015/429 and Ö 19-2015.

MAIN RESULTS
Of 748,678 boys, 7351 had surgery for cryptorchidism (cumulative incidence of 1.4%, 95% CI 1.3-1.5%). The incidence by each risk factor is presented in Figure 1. Each 30-minute increase in travel time reduced the probability of being treated before 3 years of age (adjusted HR 0.91 [95% CI 0.88-0.95], p<0.001). Low income and financial support were also independently associated with treatment delay (lowest income quintile: adjusted HR 0.82 [95% CI 0.72-0.93], p<0.001, financial support: adjusted HR 0.85 [95% CI 0.73-0.97], p=0.02).

Conclusions
One in 71 Swedish boys were operated for undescended testes by 14 year of age. Geographic access and socioeconomic features were risk factors for treatment delay. Reduced access to optimal care may diminish the anticipated benefits of centralizing paediatric surgery and anaesthesia.

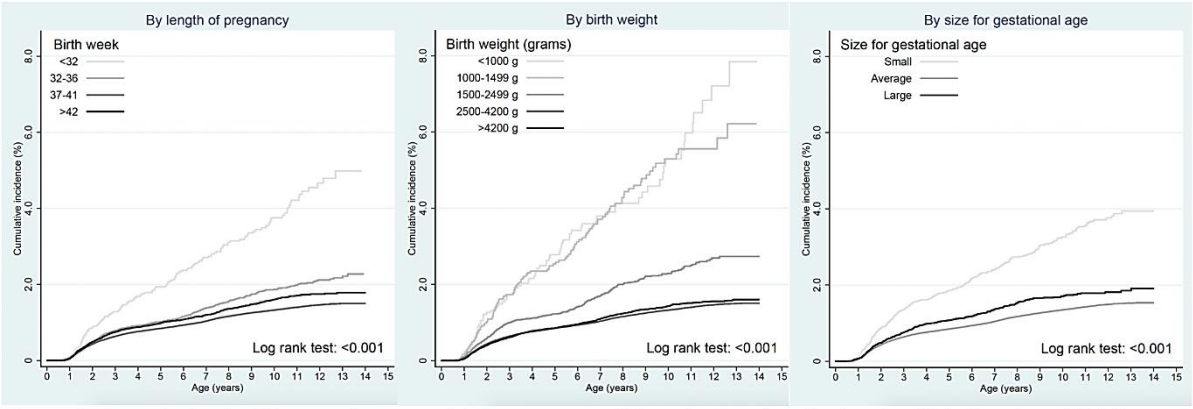

Figure 1. Cumulative incidence of cryptorchidism among all boys in Sweden, by levels of birth-related risk factors. Maternal age (p=0.42) and smoking (p=0.19) were not associated with the incidence in the univariate or the multivariable survival analysis.

YI03: EPIGENETIC REGULATION OF CDH HYPOPLASTIC LUNGS BY AMNIOTIC FLUID STEM CELL EXOSOMES

Lina Antounians[1,2], Huayun Hou[3], Cadia Chan[3], Michael Wilson[3], Augusto Zani[1,2]
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AIM OF THE STUDY

We have previously shown that in rat fetuses with congenital diaphragmatic hernia (CDH), pulmonary hypoplasia can be rescued by the administration of exosomes derived from amniotic fluid stem cells (AFSC-exo), but not from mesenchymal stem cells (MSC-exo). It is known that exosomes epigenetically regulate target cells by releasing their RNA cargo. Herein, we investigated the RNA species responsible for AFSC-exo beneficial effect on hypoplastic lungs of rat fetuses with CDH.

METHODS

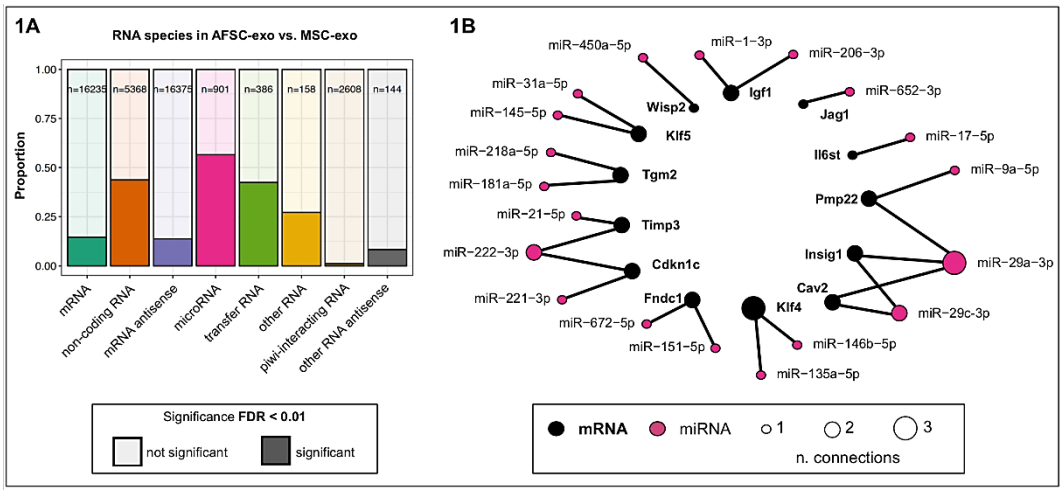
Exosomes were isolated and characterized from conditioned medium of AFSCs and MSCs (control group) using ultracentrifugation.
To identify the mediators of AFSC-exo effect on CDH lungs, we used DESeq (FDR<0.01) to differentially analyze RNA from:
A) ASFC-exo and MSC-exo cargo, isolated with SeraMir and sequenced with NextSeq.
B) lung epithelial cells from 1. normal lungs, 2. nitrofen exposed lungs treated with vehicle, 3. nitrofen exposed lungs treated with AFSC-exo. Epithelial cell RNA was isolated with miRvana and sequenced with NextSeq.

MAIN RESULTS

Of the RNA species contained in ASFC-exo/MSC-exo cargo, microRNAs were the most proportionally different between the two populations [**Fig.1A**]. AFSC-exo were enriched for microRNAs that are critical for lung development, such as microRNA17-92 that controls lung branching morphogenesis. When we investigated AFSC-exo microRNA epigenetic effects, we found 13 microRNA-mRNA interactions [**Fig.1B**].

CONCLUSIONS

AFSC-exo contain many RNA species in their cargo, but microRNAs are the main effectors of their beneficial effect on lung maturation in experimental CDH. Further studies are underway to identify the critical microRNAs that may be used for clinical application.



YI04: GENE EXPRESSION OF INTESTINAL MUCOSA REVEALS INCREASED INFLAMMATION AND DISTURBED BARRIER FUNCTION AFTER WEANING OFF PN IN CHILDREN WITH SBS

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AIM
To study mucosal homeostasis in children with short bowel syndrome (SBS) after weaning off parenteral nutrition (PN).

METHODS
Thirty-three SBS children who had weaned off PN median 3.5 years before (IQR 0.8-8.5) at median age 4.7 years (2.3-13.3) and 12 age-matched [5.4 years (2.1- 7.9) P=0.519] normal controls were included. Duodenal mucosal biopsies were analyzed for morphology, proliferation, apoptosis and inflammation using HE-staining, MIB-1 immunohistochemistry, and for RNA expression of various genes regulating inflammation, permeability, proliferation and apoptosis. RNA expression was quantified using qRT-PCR after normalization to housekeeping genes. Unpaired Mann Whitney test was used for comparisons.
RESULTS: The remaining length of small bowel was 29% (19-43%) of expected. Villus length, crypt depth, MIB-1 enterocyte proliferation grade and apoptotic index were comparable between patients and controls (Table). Inflammation of lamina propria was increased [2.0 (1.7-2.7) vs 1.5 (1.3-2.0), P=0.033], while intraepithelial leukocyte count decreased in patients [0.02 (0.02- 0.3) vs 0.04 (0.03- 0.1), P<0.001)]. Mucosal RNA expression of pro-inflammatory cytokines TNF-a, TGF-b2 and caveolin-1 were increased, whereas RNA expression of tight junction protein zonulin-2 was decreased when compared to controls (Table). RNA expression of various cell cycle regulators and proliferative growth factors was similar in patients and controls (not shown).

CONCLUSIONS
After successful intestinal adaptation and weaning off PN, duodenal mucosa of SBS children showed no structural or molecular signs of adaptive hyperplasia, but was characterized by histologic and molecular signature of increased inflammation and disturbed barrier function. These findings have important implications regarding SBS pathophysiology in humans.

Table. Comparison of mucosal homeostasis between SBS patients and controls

Mucosal property	Variable	Patients (n=33) Median (IQR)	Controls (n=12) Median (IQR)	P-value
Morphology	Villus length (mm)	0.73 (0.62-0.86)	0.81 (0.67-0.95)	0.178
	Crypt depth (mm)	0.29 (0.23-0.32)	0.27 (0.23-0.36)	0.817
Proliferation	MIB-1 grade (%)	1.33 (1.00-1.67)	1.50 (1.00-1.92)	0.848
Apoptosis	Apoptotic bodies/10 crypts	0.1 (0.0-0.5)	0.1 (0.0-0.6)	0.578
Mucosal function	**Gene**	**Patients (n=25) Mean (IQR)**	**Controls (n=12) Mean (IQR)**	**P-value**
Inflammation	TNF-α	1.50 (0.90-2.00)	1.02 (0.61-1.43)	0.027
	TGF-β2	1.49 (1.12-1.83)	1.02 (0.77-1.28)	0.006
	Caveolin-1	1.31 (1.05-1.46)	0.96 (0.91-1.05)	0.001
Barrier function	Zonulin-2	0.81 (0.62-0.99)	1.10 (0.93-1.27)	0.006

YI05: POSTNATAL DEVELOPMENT OF VASOACTIVATOR PATHWAYS IN INTESTINAL ENDOTHELIAL CELLS

Yong Chen[1,2], Yuhki Koike[2], Li Jun Chi[2], Abdalla Ahmed[2], Hiromu Miyake[2], Bo Li[2], Carol Lee[2], Paul Delgado-Olguin[2], Agostino Pierro[2]
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AIMS

Intestinal microcirculatory dysfunction can be associated with the development of necrotizing enterocolitis(NEC) in premature infants. This study aims to investigate the globe gene expression of intestinal endothelial cells during early postnatal development.

METHODS

Following ethical approval (N32238), intestinal endothelial cells were isolated from *Rosa26$^{mT/mG/+}$;Tie2-Cre* mouse, which express GFP in endothelium, using fluorescence-activated cell sorting. RNAseq was performed to compare the global gene expression profile of intestinal endothelial cells between 4 pups of postnatal day 1(P1) and 5 pups of P9 using illumina HiSeq 2500 platform. Differential expression analysis was performed using DESeq2. Enrichment of pathways in differentially expressed genes was determined by PANTHER.

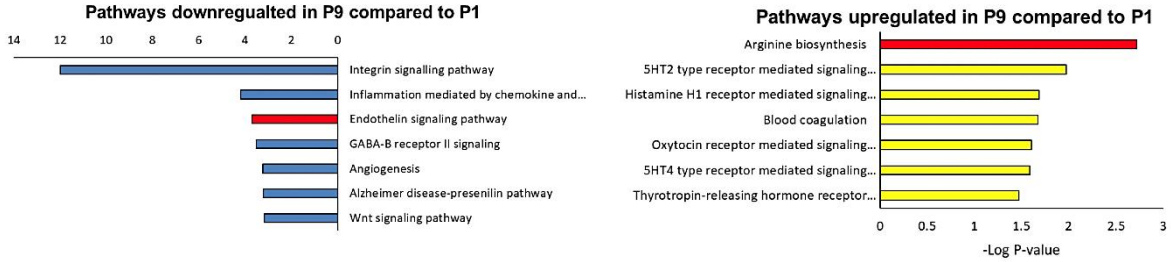
RESULTS

Of the 25,000 detected transcripts, 2,228 genes were up and 2,275 were downregulated by over 2-fold (P<0.01) in P9 *versus* P1 intestinal endothelial cells. The most significantly up-regulated pathway in P9 is arginine biosynthesis pathway which is essential for the production of NO, a crucial vasodilator. Four out of 7 genes in arginine pathway were upregulated including: carbamoyl phosphate synthase 1 (*Cps1*), argininosuccinate lyase (*Asl*), argininosuccinate Synthase 1(*Ass1*), ornithine transcarbamylase (*Cct*) and N-acetylglutamate synthase (*Nags*). On the contrary, endothelin-1 (ET-1), a major vasoconstrictor, and its receptors A (*Ednra*) are significantly reduced in P9 intestinal endothelial cells.

CONCLUSIONS

Arginine biosynthesis pathway is upregulated and ET-1 signaling pathway is downregulated in P9 compare to P1 intestinal endothelium. This finding suggests that the immature gut has a limited capacity for vasodilation, which may contribute to the development of intestinal ischemia and NEC in premature infants.

Figure1. Differential expression analysis for pathways in P1 and P9 intestinal endothelial cells.



YI06: HUMAN BREAST MILK EXOSOMES ATTENUATE THE INTESTINAL DAMAGE IN NECROTIZING ENTEROCOLITIS

Hiromu Miyake[1,2], Manvi Bhalla[1], Shogo Seo[1], Bo Li[1], Carol Lee[1], Agostino Pierro[1]
[1]The Hospital for Sick Children, Toronto, Canada. [2]Shizuoka Children's Hospital, Shizuoka, Japan

AIM OF THE STUDY

Human breast milk (HBM) is known to prevent the development of necrotizing enterocolitis (NEC). However, the detailed mechanism is not fully understood. Exosomes are nano-scaled cell-derived vesicles that are contained in HBM. Whether exosomes derived from HBM protect the intestine from NEC damage is not known. The aim of this study was to evaluate the effects of HBM exosomes in an experimental model of NEC.

METHODS

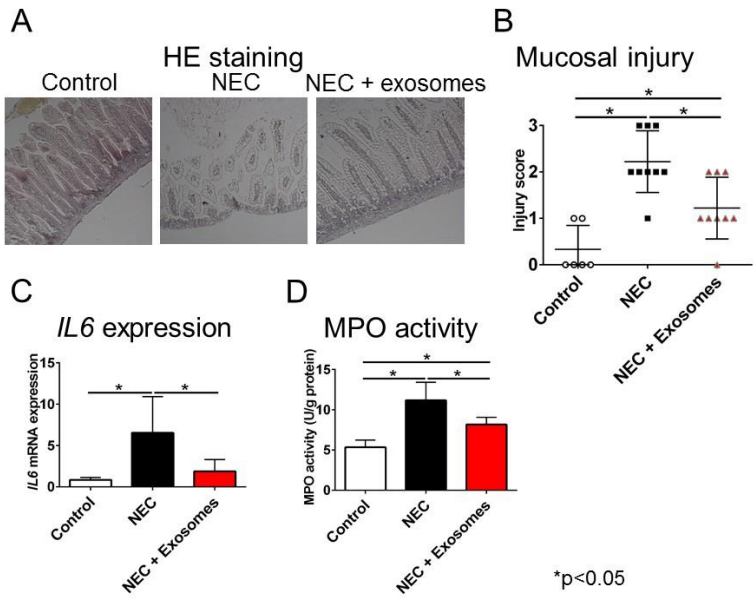
Following ethical approval (#44032), we investigated NEC in C57BL/6 mice. On postnatal day 5 (P5), pups were randomly assigned to the following 3 groups. (i) Breastfed control (ii) NEC (iii) NEC receiving HBM exosomes. Exosomes were isolated from fresh unpasteurized HBM using ultracentrifugation. NEC was induced from P5 to P9 using hypoxia, gavage administration of lipopolysaccharide and formula. In the exosome NEC group, exosomes were added to the formula. On P9, the ileum was evaluated for severity of mucosal injury (HE staining), inflammation (IL6 qPCR and myeloperoxidase (MPO) activity).

MAIN RESULTS

NEC induction was associated with significant mucosal injury. Exosome administration in NEC was associated with lower mucosal injury compared to NEC alone (Figure A,B). Similarly, NEC pups receiving exosomes had lower expression of IL6 mRNA (Figure C) and lower MPO activity (Figure D) compared to NEC alone.

CONCLUSIONS

Our results indicate that administration of exosomes derived from fresh human breast milk reduced the intestinal damage caused by NEC and attenuated the intestinal inflammation. This suggests that human breast milk-derived exosomes are protective against the development of NEC.



YI07: A NOVEL ORGANOID CULTURE TO STUDY THE NATURAL COURSE OF CONGENITAL PULMONARY AIRWAY MALFORMATIONS

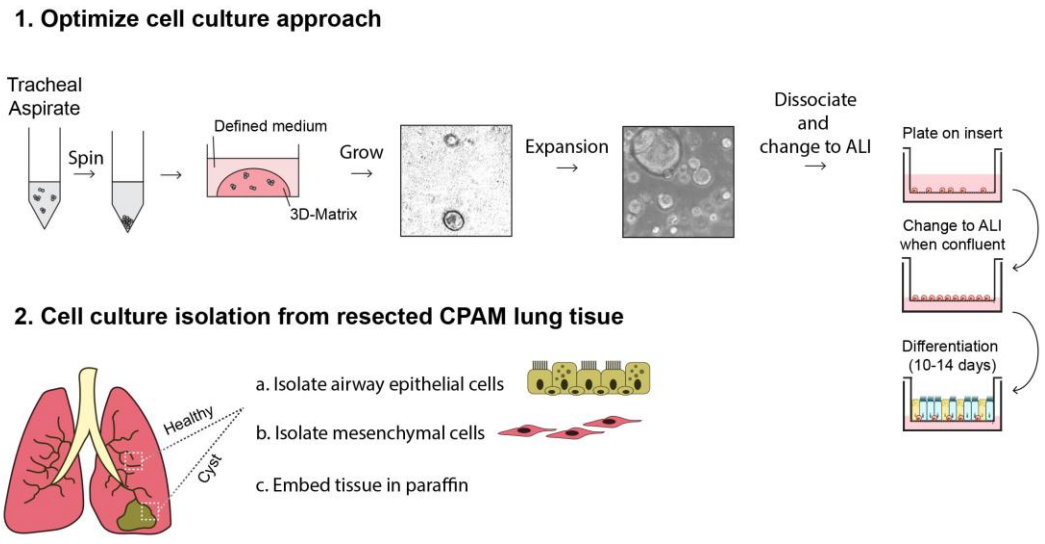
Evelien Eenjes, Marco Schnater, Dick Tibboel, Rene Wijnen, Robbert Rottier
Erasmus MC - Sophia Children's Hospital, Rotterdam, Netherlands

AIM OF THE STUDY
Congenital lung abnormalities may result in immediate critical disease and frequently lead to chronic disease later in life. Congenital pulmonary airway malformations (CPAM) is such an anomaly where the predictability of the disease course is low. We developed an *in vitro* culture system representing airway malformations to study the underlying mechanisms and the natural course of pediatric airway malformations.

METHODS
We optimized organoid cultures representing airway epithelium using neonatal tracheal aspirates (TA) or cells from resected lung tissue of CPAM patients. Cells were cultured in a 3D matrix generating airway organoids. Organoids were expanded and used for air-liquid interphase cultures (ALI) to study the airway epithelial differentiation (Figure). Cultures were characterized by cell-type specific immunostaining.

RESULTS
Organoids were used to expand the small amount of TA and CPAM material available and subsequently to setup ALI cultures to study the differentiation of airway cells. The cystic and adjacent healthy parts of the resected CPAM tissue showed differentiation towards ciliated cells. Preliminary data suggest that the cyst-derived cultures have a decreased differentiation to ciliated cells, resembling the pathogenic cysts. Furthermore, CPAM-derived organoids were bigger in size compared to the healthy tissue derived organoids (n=2). In addition, organoids could be biobanked in liquid nitrogen for future studies.

CONCLUSIONS
We successfully generated airway organoids and studied differentiation of airway cells from both TA and resected lung tissue of CPAM patients. This is a promising culture system to study the molecular mechanisms underlying origin, growth and progression of congenital airway malformations.



YI08: MANAGEMENT AND OUTCOMES OF PEDIATRIC CHOLEDOCHAL MALFORMATIONS IN THE NORDIC COUNTRIES

Maria Hukkinen[1], Kristin Björnland[2], Vladimir Gatzinsky[3], Tarja Iber[4], Lars Söndergaard Johansen[5], Niels Qvist[6], Pernilla Stenström[7], Jan Svensson[8], Mikko P. Pakarinen[1]
[1]Helsinki University Children's Hospital, Helsinki, Finland. [2]Oslo University Hospital, Oslo, Norway. [3]Queen Silvia Children's Hospital, Gothenburg, Sweden. [4]Tampere University Hospital, Tampere, Finland. [5]Rigshospitalet, Copenhagen, Denmark. [6]Odense University Hospital, Odense, Denmark. [7]Skåne University Hospital, Lund, Sweden. [8]Astrid Lindgren Children's Hospital, Karolinska University Hospital, Stockholm, Sweden

AIMS OF THE STUDY
To evaluate current incidence, management, and outcomes of pediatric choledochal malformations (CMs) in the Nordic countries.

Methods. CM patients' baseline characteristics, operative details, and follow-up data were collected from pediatric surgical centers in Sweden, Norway, Denmark, and Finland.

MAIN RESULTS
During 2000-2017, 126 children were diagnosed with CMs, corresponding an incidence of 1:37,400. Of patients with adequate clinical data available (n=119), 49 (41%), 52 (44%), and 13 (11%) presented with type I cystic, fusiform, and type IV CMs, respectively. MRCP had been performed in 108 patients (91%) and intraoperative cholangiography in 58 (52%). Median age at surgery was 2.5 (interquartile range 0.46-5.8) years, and 21 CMs (18%) were detected antenatally. Associated malformations were more common in fusiform and type IV (23%) than cystic CMs (8%, p=0.043). Pancreaticobiliary maljunction was more frequently confirmed in patients presenting with pancreatitis (26% vs. 7%, p=0.005) and with fusiform CMs (56% vs. 25%, p=0.001). Most (95%) type I and IV CMs underwent open hepaticojejunostomy with an early complication rate of 12% (n=13/108). Although cholangitis/pancreatitis episodes had occurred in 12% by postoperative follow-up of 4.0 (2.0-7.9) years and their occurrence associated with increasing surveillance period (OR 1.32, 95% CI 1.13-1.54, p<0.001), only two thirds of centers continued follow-up until adulthood with transition. No malignancies were reported.

CONCLUSIONS

CM incidence in the Nordic countries is higher than traditionally reported among Western populations. Hepaticojejunostomy is an established management and carries good short-term outcomes. Standardized evidence-based management strategies and uniformly life-long follow-up are encouraged.

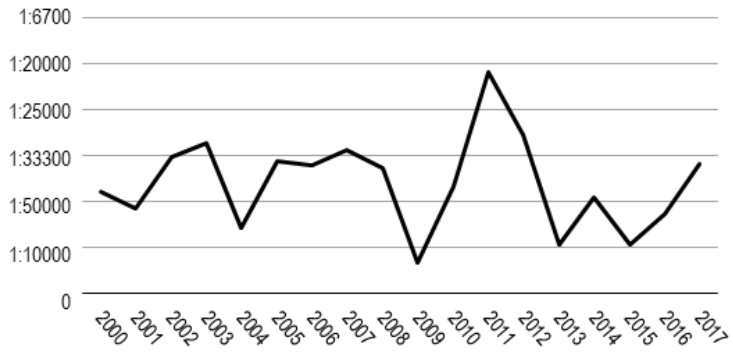


Figure. The incidence of CMs in the Nordic countries during 2000-2017.

YI09: INTESTINAL STEM CELLS DURING THE ACUTE AND POST RECOVERY PHASE OF NECROTIZING ENTEROCOLITIS

Bo Li, Carol Lee, Yuhki Koike, Hirumo Miyake, Marissa Cadete, Agostino Pierro
The Hospital for Sick Children, Toronto, Canada

Abstract

Aim of the study:

Intestinal stem cells marked by Lgr5 (Lgr5+ ISC) are important for maintaining intestinal epithelial renewal and regeneration. The aim of this study was to investigate Lgr5+ ISC expression during and after necrotizing enterocolitis (NEC) injury in both mice and humans.

Methods:

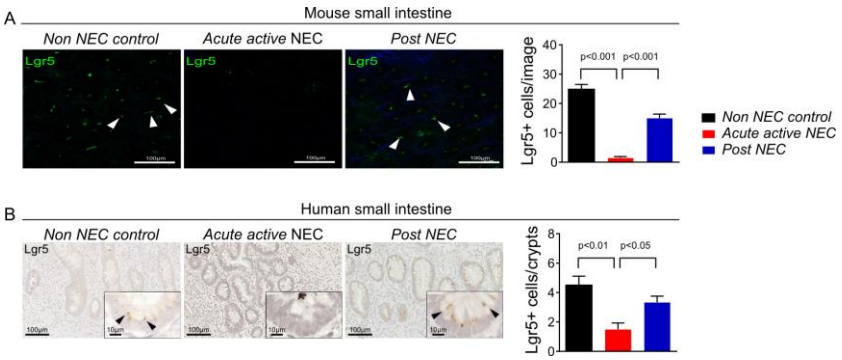
Mice: NEC was induced in Lgr5-GFP-IRES-CreETR2 mice from postnatal days (P) 5-9 and then returned to their mother to receive breastfeeding until P21 (approval #44032). At P9 (*Acute active NEC*) and P21 (*Post-NEC*), the expression of endogenous intestinal stem cells was studied.
Humans: Small portion of ileum was resected in neonates (REB #1000056881). Three groups were studied: 1) infants with *Acute active NEC*; 2) infants who recovered from NEC and undergoing resection of the ileum (*Post NEC*); 3) age-matched control infants with congenital intestinal obstruction (*Non NEC control*).

Main Results:

Mice: At P9 (*Acute active NEC*), there is a decrease in Lgr5+ ISC. At P21 (*Post NEC*), the intestinal injury was recovered and the expression of Lgr5+ISC returned to the same level as control (Figure A).
Humans: Similarly, Lgr5+ ISC expression was decreased in *Acute active NEC*, and recovered in *Post NEC* to the levels observed in age-matched control (Figure B).
Mice and human findings were confirmed by significant ($p<0.05$) differences in Lgr5 gene and protein expression.

Conclusions:

We demonstrated for the first time that active intestinal stem cells are impaired in human neonates with active NEC and return to normal after NEC resolution. Endogenous stem cell activation is important to promote intestinal recovery in NEC.



YI10: HOW SHOULD WE PLAN TRANSITION FOR HIRSCHSPRUNG PATIENTS? – RESULTS FROM A TWO-CENTER FOCUS GROUP DISCUSSION STUDY

Anders Telle Hoel[1], Louise Tofft[2], Marit Helen Andersen[3,4], Svein Staff[5], Helene Gjone[3], Astrid Austheim[3], Catherine Teig[5], Tom Øresland[5,4], Pernilla Stenström[2], Kristin Bjørnland[3,4]
[1]Oslo University Hospital , Oslo, Norway. [2]Lund University Hospital, Lund, Sweden. [3]Oslo University Hospital, Oslo, Norway. [4]University of Oslo, Oslo, Norway. [5]Akershus University Hospital, Oslo, Norway

BACKGROUND
There is insufficient knowledge about how, when and by whom adult Hirschsprung patients should consult as adults. The aim was to obtain knowledge about how adult patients want transitional care and their perception of living with a rare congenital disorder.

METHODS
Qualitative study design using gender equal focus group discussions at two Scandinavian University Hospitals. The verbatim transcripts were analyzed using principles of qualitative content analysis. Ethical approvals were obtained.

RESULTS
17 non-syndromic (nine men) with a median age of 29 (19-43) years were included. All were operated with the Duhamel technique, and one had total colonic aganglionosis. Five major themes emerged from the focus group discussions. These included (1) lack of knowledge about HD among health care providers outside the pediatric surgical departments (2) unawareness about where to find expertise on HD as adults (3) digestive problems including various food intolerances (4) secrecy about their condition to friends, partner and family, and (5) embarrassment of scars. Furthermore, all patients wanted easy access to health care providers with expertise on HD when HD related problems occurred. A regular follow-up program was considered unnecessary. The adult patients advised planning of transition to start in early teens.

CONCLUSION
Our study provides new important insight regarding growing up and to live with HD as an adult. Both somatic and psychological issues remain in adulthood. Patients want easy access to centers with expertise on HD when they seek medical assistance for HD related problems.

GE101: INFLUENCE OF OVERWEIGHT AND OBESITY IN ACUTE APPENDICITIS IN CHILDREN. COHORT STUDY

Carlos Delgado-Miguel , Antonio Jesús Muñoz-Serrano , Saturnino Barrena, Vanessa Núñez Cerezo , María Velayos, Karla Estefanía, Javier Serradilla, Leopoldo Martínez
Hospital Universitario La Paz, Madrid, Spain

AIM OF THE STUDY

Overweight and obesity are risk factors for the development of postsurgical complications in acute appendicitis in adults. However, there are few studies that evaluate its effects in pediatric patients. We aim to analyze its influence in the postoperative course of acute appendicitis in children.

METHODS

Prospective cohort study was performed in patients undergoing acute appendicitis during 2017-2018, divided into two cohorts according to the BMI adjusted to the gender and age following the WHO criteria: exposed cohort (overweight-obese) and unexposed cohort (normal weight). Clinical follow-up was performed during hospital admission and one month after surgery. Demographic variables, surgical time, average hospital stay and early postoperative complications (infection, wound dehiscence and intra-abdominal abscess) were assessed.

MAIN RESULTS

A total of 403 patients were included (exposed cohort n=97 and not exposed cohort n=306) with no differences in gender or age. A longer surgical time was observed in the exposed cohort (57.6±22.5 *vs* 44.6±18.2min, p<0.001), without differences in the surgical technique (open or laparoscopic). This group had also a higher surgical wound infection rate when compared with the non-exposed cohort (10.3% *vs* 4.2%, RR 1.90, CI95% [1.15-3.14], p<0.001), as well as surgical wound dehiscence (7.2% *vs* 2.3%; RR 2.16, CI95% [1.24-3.76], p<0.001). No differences were observed in the development of intra-abdominal abscesses or in the average hospital stay.

CONCLUSIONS

Obese and overweight children with appendicitis have more risk for the development of postoperative complications such as infection and wound dehiscence than normal weighted patients.

	Overweight-Obesity (n = 97)	Normal weight (n = 306)	p value	Relative Risk
Gender				
• **Men**	64 (66%)	185 (60.5%)	0.329	-
• **Women**	33 (34%)	121 (39.5%)		
Age	10.09 ± 3.19	10.07 ± 3.17	0.94	-
Surgery time	57.57 ± 22.53	44.60 ± 18.19	<0.001	-
Length of hospital stay	3.43 ± 2.75	3.29 ± 2.87	0.344	-
Complications				
• **Wound infection**	10 (10.3%)	13 (4.2%)	0.025	1.90 (1.15-3.14)
• **Wound dehiscence**	7 (7.2%)	7 (2.3%)	0.021	2.16 (1.24-3.76)
• **Intra-abdominal abscess**	5 (5.2%)	16 (5.2%)	0.97	0.99 (0.45-2.17)

GE102: THE ASSOCIATION BETWEEN TREATMENT MODALITY AND COMPLICATIONS IN PAEDIATRIC APPENDICITIS

Erik Omling[1,2], Martin Salö[1,2], Saurabh Saluja[3], Sanna Bergbrant[1], Louise Olsson[1], Jonas Björk[4,5], Lars Hagander[1,2]

[1]Lund University, Clinical Sciences, Department of Paediatrics, Lund, Sweden. [2]Skåne University Hospital, Department of Paediatric Surgery, Lund, Sweden. [3]Department of Surgery, Weill Cornell Medicine, New York, USA. [4]Lund University, Skåne University Hospital, Department of Laboratory Medicine, Lund, Sweden. [5]Lund University, Skåne University Hospital, Clinical Studies Sweden, Forum South, Lund, Sweden

STUDY AIM

Laparoscopic appendectomy is the standard treatment for paediatric appendicitis at many centres. The aim of this study was to determine complication risks related to treatment modality in paediatric appendicitis.

METHODS

All cases of paediatric appendicitis in Sweden 2001-2014 (n=38,939) were dichotomized by severity of disease at first admission (by presence of peritonitis or abscess) and categorized by treatment modality. Outcomes were length of stay (LoS), occurrence of readmission, re-operation, or surgical site infection (SSI) within 30 days from discharge. Risk of small bowel obstruction (SBO) during follow-up was assessed with multivariable survival analysis (median follow-up: 7.4 years). Ethical approval: 2014/792.

MAIN RESULTS

The overall proportion of paediatric appendicitis treated with laparoscopic appendectomy has increased from 10% to 52% in Sweden during the study period. Complicated appendicitis was associated with longerLoS (4 [IQR 3-6] versus 2 [1-3] days, p<0.001), more readmissions (5.5% versus 1.2%, adjusted OR 4.74 [95% CI 4.08-5.53], p<0.001), SSI (5.9% versus 2.3%, adjusted OR 2.64 [95% CI 2.18-3.18], p<0.001) and more SBO (0.7% versus 0.2%, Figure 1). When adjusted for type of appendicitis, year, gender and age, laparoscopic appendectomy was associated with less SSI (adjusted OR 0.65 [95% CI 0.54-0.79], p<0.001) and less SBO (adjusted HR 0.27 [95% CI 0.11-0.63], p=0.002), as compared to open appendectomy.

CONCLUSIONS

Whereas complicated appendicitis in children was associated with a considerable increase in short- and long-term complications, laparoscopic appendectomy may reduce these risks. Advancing the use of laparoscopy in paediatric appendicitis may reduce morbidity and costs in Sweden.

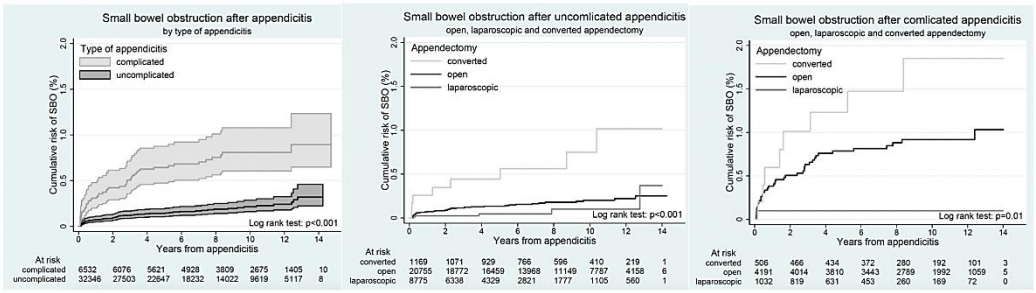


Figure 1. Cumulative risk of small bowel obstruction requiring surgery after appendicitis in Swedish children.
Left: By type of appendicitis (adjusted HR 3.89 [95% CI 2.61-5.78], p<0.001).
Center: By type of treatment in uncomplicated appendicitis (adjusted HR following laparoscopic appendectomy 0.36 [0.13-0.94], p=0.04 and adjusted HR following converted procedure 4.7 [2.1-10.7], p<0.001, as compared to open appendectomy).
Right: By type of treatment in complicated disease (adjusted HR following laparoscopic appendectomy 0.12 [0.02-0.93], p=0.04 and adjusted HR following converted procedure 2.0 [0.9-4.6], p=0.08, as compared to open appendectomy).

GE103: ACTIVATION OF HEDGEHOG SIGNALING IN AGGRESSIVE HEPATIC HEMANGIOMA IN NEWBORNS AND INFANTS

Danielle Wendling-Keim, Lynn Wanie, Rainer Grantzow, Dietrich von Schweinitz, Roland Kappler, Michael Berger
Dr. von Haunersches Kinderspital, University of Munich, Pediatric Surgery, Munich, Germany

BACKGROUND
Hepatic hemangiomas (HH) are vascular tumors typically found in the pediatric liver. They are usually harmless but can show an aggressive course with significant complications. Prognostic markers that identify an aggressive course are entirely absent. Here, we hypothesize that hedgehog signaling is altered in aggressive HH.

METHODS
Patient records and specimen of 7 children with aggressive HH were analyzed. Immunohistological staining for GLUT1 was carried out. Additionally, quantitative PCR was performed to investigate the expression of the marker genes *FGF2* and *GLUT1* as well as the hedgehog signaling components *SHH* and *GLI2* and its target gene *FOXA2*. For comparison, we analyzed three cases of kaposiform hemangiomendothelioma (KHE) and compared our results to normal liver tissue as well as aggressive infantile hemangiomas of the skin.

RESULTS
Six cases of HH were unifocal, and one was multifocal. Unifocal cases stained negative for GLUT1 upon immunohistochemistry, and the multifocal case stained positive. Notably, significant upregulation of the hedgehog signaling component *SHH* as well as its transcription factor *GLI2* and its target gene *FOXA2* were detected in all cases ($p<0.05$). Further, we found a positive correlation between expression levels of *SHH* and *FOXA2* in HH ($r=0.82143$; $p=0.02345$), but none for normal liver tissue ($r=-0.14286$; $p=0.78717$).

CONCLUSION
The study demonstrated an overexpression of hedgehog signaling in aggressive HH similar to KHE and aggressive hemangioma of the skin. This finding can help efforts to understand and identify aggressive growth in HH, possibly making it a biomarker and allowing early intervention.

GE104: PRENATAL AND NEONATAL OUTCOMES OF HYPERECOGENIC FOETAL BOWEL: REPORT ON 184 PRENATAL CASES

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AIM

Fate of patients with prenatally diagnosed hyperechogenic bowel (HB) is poorly explored.
Aim of present study was to investigate prenatal and perinatal outcomes of foetuses with HB.

METHODS

This is a prospective study (2011-2017) of all foetal HB cases evaluated in a tertiary referral centre. Foetal and neonatal mortality, intrauterine growth retardation (IUGR), foetal bowel dilatation, associated anomalies, genetic disorders (including cystic fibrosis) and congenital infection were evaluated. Chi-squared test were used as appropriate, $p<0.05$ was consider significant

MAIN RESULTS

We identified 184 fetuses with HB, of which 110 spontaneously resolved at US. HB persistency (more than 2 foetal US) was associated to increased rate of congenital infection and bowel dilatation (14% vs 4%; p=0,04 and 52% vs 23%; p=0,0007, respectively).However, also foetuses experiencing HB resolution still have 46% (51/110) chances to present clinical complications.
Overall, we observed 5 (3%) cystic fibrosis, 10 (5%) other genetic disorders, 13 (7%) congenital infections, 5 (3%) neonatal deaths, 12 (7%) intestinal anomalies, 24 (13%) other malformations, and 19 (10%) IUGR. IUGR was more common when HB was discovered during III-trimester (II-trimester 7/122 vs III-trimester 12/62; p=0,008). Bowel dilatation often developed throughout III-trimester (II-trimester 29/122 vs III-trimester 35/62; p=0,0001).

CONCLUSIONS

Although spontaneous resolution of HB was commonly observed, a significant proportion of HB patients challenged serious problems. HB resolution does not protect from IUGR, bowel dilatation, genetic and malformative disorders, and risk of neonatal death.
Active prenatal HB search is warranted to better inform parents, ideally reducing late morbidity and mortality.

GE105: THE EFFECT OF VIRTUAL REALITY BEFORE ELECTIVE SURGERY ON ANXIETY AND PAIN IN CHILDREN: A LARGE RANDOMIZED CONTROLLED TRIAL

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AIM OF THE STUDY
Preoperative anxiety in children is highly prevalent and associated with adverse outcomes. In this study, the effect of virtual reality (VR) is examined as preparation tool for elective day care surgery in children to reduce anxiety and pain.

METHODS
This single-blinded study, approved by the Medical Ethics Committee (MEC-2016-626), included 200 patients (4-12 years old) undergoing maxillofacial, dental, or ear-nose-throat surgery, who were randomly assigned to VR (n=100) or care-as-usual (CAU) (n=100). Through VR, children could get accustomed to anesthesia procedures (Figure 1). Anxiety during induction was assessed with the validated modified Yale Preoperative Anxiety Scale (mYPAS). Pain was assessed using the validated Faces Pain Scale (FPS-*r*) and Face, Legs, Activity, Cry, and Consolability (FLACC). Need for escape medication (morphine) was also examined. Children received standard paracetamol and NSAIDs.

MAIN RESULTS
mYPAS Scores (medians, interquartile values [iqr]) were similar in VR (40.0, 28.3–58.3) and CAU (38.3, 28.3–53.3, *p*=0.862). No differences were found between conditions in FPS-*r* (VRE: 2.0, 0.0–4.0, CAU: 2.0, 0.0–2.5, *p*=0.699) or FLACC scores (VRE: 0.0, 0.0–0.0, CAU: 0.0, 0.0–0.0 , *p*=0.669). After adenoidectomy/tonsillectomy, children in the VR condition less often needed escape medication (VR: n=11, 55.0%, CAU: n=22, 95.7%, *p*=0.002).

CONCLUSIONS
No differences in anxiety and pain were found between VR and CAU. However, after painful surgery, children in the VR condition less often needed escape medication. More research is needed on the ideal number of sessions and timing of VR preparation in relation to different medical procedures.

Figure 1. Virtual reality environment. Top: A receptionist welcomes the child to the holding area. Middle: The anesthesiologist performs intravenous line placement, in the operating room. Bottom: The child wakes up in the recovery room.

GE106: PROSPECTIVE ASSESSMENT OF UNEXPECTED EVENTS IN 1124 PATIENTS: HIGH INCIDENCE OF SURGICAL COMPLICATIONS, ORGANIZATIONAL PROBLEMS AND MEDICAL ERRORS

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AIM
We hypothesized that unexpected events in pediatric surgical patients are underreported and the incidence is high. A prospective documentation of such events should be performed in order to identify and analyze minor complications, sentinel events and organizational problems during an 18-months period.

METHODS
All unexpected events in the treatment of patients including surgical and non-surgical complications, organizational problems and medical errors were documented prospectively on daily basis from 02/2017-07/2018. Complications were classified according Clavien–Dindo. Sentinel events were defined as death, serious injury, or the risk thereof (grade IV-V). Organizational events were analyzed separately. All events were discussed during morbidity and mortality-conferences.

RESULTS
Unexpected events occurred in 439 out of 1124 patients (39%) who had undergone 1576 operations. Most of these events were surgical complications (n=333; 30%) which were mostly minor (grade I; n=169; 15%). However, grade IIIb complications requiring surgical intervention occurred in 160 patients (14%) and sentinel events in 28 patients (3%). Twenty-two (2%) patients died, two of them related to surgery. The top 5 events included organizational problems in 78 (18%), wound healing disorders in 44 (10%), recurrence of initial problems in 36 (8%), dislocation of indwelling catheters in 26 (6%) and bleeding in 16 (4%). Medical errors were identified in 15 patients (3%).

CONCLUSIONS
More than 1/3 of the patients of our series experienced an unexpected event. Most complications and organizational problems didn't affect patient´s outcome. In the light of a relevant incidence of medical errors and sentinel events preventive strategies are mandatory.

GE107: CLASSICAL BUT NOT RAP MUSIC SIGNIFICANTLY IMPROVES TRAINING OF COMPLEX MOTOR SKILLS: A PILOT RCT

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BACKGROUND
Acoustic distractions increase the level of stress and workload in the operating room. Noise significantly reduces surgical performance, but has been shown to improve learning and performance of complex motor skills. Aim of this study was to evaluate the influence
of music on laparoscopic training.

METHODS
To evaluate the effects of music on training, subjects were asked to perform four surgeon's square knots on a bowel model within 30 minutes - prior and post 3 hours of hands-on training. To examine
the long-term skills the same students were asked to perform a comparable, but more complex, task (four slip knots in a model of esophageal atresia) six months later as follow-up measurement. Total time, knot stability (evaluated via tensiometer), suture accuracy, knot quality (Muresan scale), and laparoscopic performance (Munz checklist) were assessed.

RESULTS
Twenty-four students were included in the study; after simple randomization, sixteen were trained with music (of them eight with Bach and eight with Bushido) and eight via traditional methods. Both
groups had comparable baseline characteristics and improved after training significantly, regarding all aspects assessed in this study. Subjects that trained with Bach were superior in terms of speed, and laparoscopic performance.

CONCLUSIONS
Music during acquisition of complex motor skills like laparoscopic suturing and knot tying is superior to traditional training. Especially, music that is considered as non-disturbing significantly improved speed and performance. Thus, we recommend incorporating music into training during courses and in the OR.

GE108: TRAVEL DISTANCE AND THE RISK FOR COMPLICATED APPENDICITIS IN CHILDREN: A NATIONWIDE COHORT STUDY

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AIM OF THE STUDY

Appendicitis is the most common cause of emergency abdominal surgery in children. Whereas treatment is increasingly centralized, prehospital delay has been associated with higher risk of complicated disease. The aim was to determine the association between geographic distance to hospital and the risk of complicated paediatric appendicitis.

METHODS

All cases of paediatric appendicitis between 2001-2014 were identified in Swedish healthcare registers. Data on socioeconomic background and the population at risk were collected. Cumulative incidence of appendicitis was calculated. Appendicitis with generalized peritonitis or abscess was considered complicated, and travel time in minutes was estimated with GIS-methods. Regression analysis was used to estimate the effect of travel time by car to treating hospital on the risk for complicated appendicitis, with adjustment for age, year, and socioeconomic determinants. Ethical approval: 2014/792, Ö18-2015.

MAIN RESULTS

The cumulative incidence of appendicitis until age 18 was 2.5% (n=38,939), with 27.3% higher incidence among boys than girls [95% CI 24.8-29.9%, p<0.001]. Complicated appendicitis accounted for 17% of cases, with no gender differences. Increasing travel time to hospital was not associated with the risk of complicated disease; after adjustment for year, age and socioeconomic determinants, the OR for each 30-minute increase in travel time was 1.00 [95% CI 0.96-1.05], p=0.93 (Figure 1).

CONCLUSIONS One in 40 children in Sweden suffered appendicitis during childhood, and every sixth child with appendicitis developed a complicated course of disease. All things considered, the distance to hospital was not related to the disease severity.

	Complicated disease Less More	Odds ratio (95% confidence interval)	P-value
Travel time to treating hospital			0.93
By each 30 minutes increase		1.00 (0.96 to 1.05)	
Education (years)			0.18
>12		1	
10-12		0.97 (0.93 to 1.02)	
<10		0.90 (0.81 to 1.01)	
Employment			0.006
Employed		1	
No employment		1.17 (1.05 to 1.32)	
Income quintiles			0.12
Q5 (highest income)		1	
Q4		1.00 (0.93 to 1.08)	
Q3		1.03 (0.95 to 1.11)	
Q2		0.95 (0.84 to 1.08)	
Q1 (lowest income)		1.07 (0.98 to 1.17)	
Financial support			0.88
No support		1	
Support		1.01 (0.88 to 1.16)	
Origin of parents			<0.001
Both Swedish		1	
One parent Swedish		1.12 (1.01 to 1.25)	
No parent Swedish		1.32 (1.18 to 1.47)	
	0,8		

Figure 1. Multivariable effect estimates of travel time to treating hospital on the risk of complicated appendicitis. Adjusted for socioeconomic determinants, age and year, and stratified on county of treatment.

GE109: IS THERE ANY HELP FROM LABORATORY STUDIES AND US EXAM IN THE DIAGNOSIS OF APPENDICITIS?

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INTRODUCTION
The diagnosis of appendicitis in children remains challenging especially in atypical clinical presentations and patients under 5 years-old. The aim of our study was to evaluate the help of laboratory test and US in the diagnosis of appendicitis in children.

METHODS
A randomized subset of 40 cases of operated appendicitis and 40 non-operated controls were drawn each year from 2012 to 2016 (Appendicitis = 200, Controls = 200). We performed multivariate logistic regression model combining the WBC, the CRP level and appendix diameter on US to set the efficiency of these features in the diagnosis of acute appendicitis.

MAIN RESULTS
The result of the ROC curve showed maximal sensitivity for the positive diagnosis of appendicitis was reached for an appendix diameter at 6.5 mm (96.79%) as maximum specificity was achieved for an appendix diameter > 7 mm (98.47%) but there was no threshold that could make the difference between simple and complicated appendicitis.
WBC > 10000 per µL had a sensitivity of 82.7 % and a specificity of 66.8% for the diagnosis of appendicitis and no threshold was found between simple and complicated appendicitis.
CRP> 8 dg/dL had a sensitivity of 81.7 % and a specificity of 66.8 % and threshold of 50 dg/dL reach a specificity of 90% in the distinction between simple and complicated appendicitis.

CONCLUSION
In cases of difficult diagnosis of appendicitis, appendix diameter on US is the most accurate complementary exam whereas CRP level helps in the confirmation of complicated forms.

TH01: TARGETED NEXT GENERATION SEQUENCING FOR FAST DETECTION OF ALVEOLAR CAPILLARY DYSPLASIA WITH MISALIGNMENT OF THE PULMONARY VEINS

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AIM OF THE STUDY
Our aim was to develop a fast genetic test that can reduce the time to diagnose alveolar capillary dysplasia with misalignment of the pulmonary veins (ACD/MPV). This rare and lethal developmental lung disorder is associated with variants in the *FOXF1* locus. Currently, ACD/MPV is diagnosed by lung biopsy after exposing the patient to invasive and expensive treatments like ECMO. Once the diagnosis is confirmed, treatment is withdrawn which leads to the patient's death. Fast screening for *FOXF1* variants in the early stage of symptom presentation will reduce the time to diagnose ACD/MPV and prevent unnecessary treatments.

METHODS
We developed a targeted panel for Ion Torrent NGS to detect variants in the *FOXF1* locus. We tested 18 ACD/MPV DNA samples isolated from fresh tissue, like blood or cultured fibroblasts, and 18 ACD/MPV DNA samples isolated from formalin-fixed and paraffin embedded (FFPE) tissue.

RESULTS
All DNA samples isolated from fresh tissue were sequenced efficiently. In these samples, we confirmed 6 previously described and detected 6 novel *FOXF1* variants. The sequencing efficiency of DNA samples isolated from FFPE tissue was highly variable due to poor DNA qualities, but still we detected 2 novel *FOXF1* variants.

CONCLUSIONS
We designed a rapid DNA test that enables detection of *FOXF1* variants when DNA isolated from fresh tissue is used. It is a reliable method that reduces the time between hospitalization and diagnosing ACD/MPV. Thereby, unnecessary suffering and the use of futile and expensive treatments can be avoided.

TH02: CT-QUANTIFICATION OF CONGENITAL LUNG ABNORMALITIES MAY AID IN PREDICTING OUTCOME

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AIM OF THE STUDY
A consensus in the optimal management of congenital lung abnormalities(CLA) may be reached by identifying predictive factors for certain outcome parameters. We aimed to identify structural factors to aid in clinical decision-making, using an objective quantitative CT scoring method.

METHODS
CT-scans of all patients born with a CLA from 2000 onwards were assessed. The percentage diseased lung (%Dis) was quantitated using the congenital lung abnormality quantification(CLAQ) scoring method. Twenty equidistant axial slices of volumetric CT-scans were annotated by scoring any abnormality within. Outcome parameters were developing symptoms, SD scores for lung function (spirometry) and exercise tolerance (Bruce treadmill test) at 8 years of age. Regression analyses were used to analyze associations between quantitative CT parameters and outcome.

MAIN RESULTS

We annotated eligible CT-scans of 124 patients. Clinical diagnoses included congenital pulmonary airway malformation(49%), bronchopulmonary sequestration(27%), congenital lobar emphysema(21%) and a bronchogenic cyst(1%). Forty-four patients(35%) developed symptoms requiring surgery. A unit increase in the %Dis increased the odds of becoming symptomatic by 12% (95%CI: 8-17%). Furthermore, a unit increase in %Dis was associated with a 4% (95%CI: 2-6%) decrease in FEV_1 SD or 2% (95%CI: 1-4%) decrease in FEF_{25-75} SD at the age of 8 years, whereas no significant association was seen with exercise tolerance. All significant results had a p-value < 0.05.

CONCLUSIONS

CT-quantification using the CLAQ score may be a useful tool in clinical decision-making to predict the risk for future surgical interventions in CLA patients.

TH03: MANAGEMENT OF SPONTANEOUS PNEUMOTHORAX IN CHILDREN: A SYSTEMATIC REVIEW AND META-ANALYSIS

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AIM OF THE STUDY

Management of spontaneous pneumothorax (SP) is mainly based on adults. Data are controversial regarding its management in children. We aimed to assess: 1. the length of hospital stay (LOS) between conservative (observation, aspiration, chest drain) and surgical management; 2. the risk of recurrence after conservative treatment *versus* surgery; 3. the risk of recurrence in the presence of bullae.

METHODS

Using a defined search strategy, two independent investigators identified all the studies regarding the management of SP in children. Case reports, opinion articles, and grey literature publications were excluded. The study was conducted according to PRISMA guidelines. A meta-analysis was performed using RevMan 5.3. Data are expressed as mean±SD.

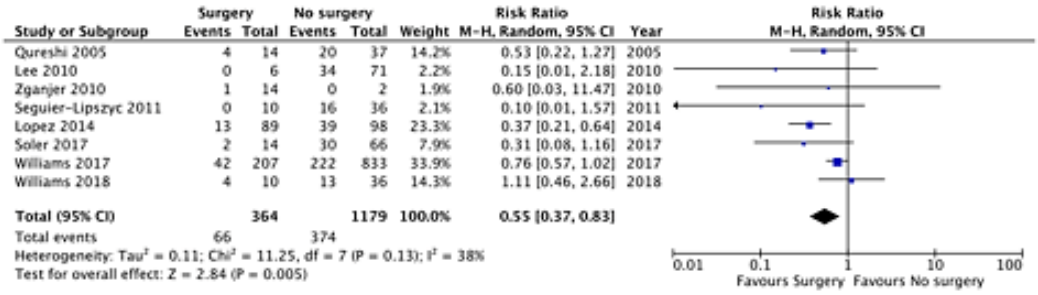
MAIN RESULTS

Of 3089 abstracts screened, 48 full-text were analyzed, 15 were included in the quantitative analysis and 11 were included in the meta-analysis (1,598 patients). LOS was similar between conservative and surgical management (5.9±1.4 days *versus* 6.2±0.8 days; p=ns). Recurrence of SP was significantly higher among children treated conservatively (374/1,179pts, 32%) *versus* surgery (66/364pts, 18%; p<0.01, **Figure**). The incidence of recurrence was similar in observation (66/369pts, 18%) *versus* aspiration or chest drain (199/598pts, 33%; p=ns).

Risk of recurrence in patients with or without documented bullae was not significantly different (22/86pts, 26% *versus* 63/164pts, 38%, respectively; p=ns).

CONCLUSIONS

Given the lack of a standardized management of pediatric SP, the present study seems to demonstrate a better outcome in children treated with surgery as first-line of management.



TH04: INTRALUMINAL TREATMENT OF ESOPHAGEAL STENOSIS IN CHILDREN WITH EPIDERMOLYSIS BULLOSA

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AIM OF THE STUDY

To prove efficiency and safety of balloon dilatation (BD) in esophageal stricture's treatment in children with epidermolysis bullosa and the impact of oral budesonide as a measure for the prevention of restenosis

METHODS

40 patients with esophageal strictures and symptoms of dysphagia. 20 patients received treatment in the form of BD (group 1); 20 patients, along with BD, received budesonide per os. The effectiveness of procedure and the impact of oral budesonide were assessed: change in the level of dysphagia, stricture index (SI), THINC scale, the number of repeated interventions and the presence of complications.

MAIN RESULTS

Dynamics before and after treatment after 6 months: group 1-dysphagia (from 2.9±0.7 to 0.6 0.7), SI (from 0.74±0.02 to 0.26±0.02); THINC (from 63.8±2.8 to 47.8±2.8); group 2-dysphagia (from 2.9±0.5 to 0.3±0.6), SI (from 0.74±0.02 to 0.09 ± 0.02), THINC index (from 63.8 ± 2.8 to 33.8 ± 2.8). The number of relapses during 6 months was: in group 1 - 30.0%, in group 2 - 5.0% of cases. Significant complications did not occur. After the BD, the distribution of patients in all the examined groups according to dysphagia, THINC and SI changed dramatically and statistically significantly ($p<0.001$). However, in group 2 there is a stable remission for the observation period of more than 3 years.

CONCLUSION

Balloon dilatation with budesonide per os is an effective and safe method of treatment of esophageal stricture in children with epidermolysis bullosa.

TH05: CONGENITAL DIAPHRAGMATIC HERNIA AND ASSOCIATED OMPHALOCELE: A STUDY FROM THE CDHSG REGISTRY

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BACKGROUND
Congenital Diaphragmatic Hernia (CDH) associated with Omphalocele is a rare condition.

AIM
The aim of this study was to describe the incidence of this association and postnatal outcomes from a large database for CDH.

METHODS
Data from the multicenter, multinational database on infants with CDH (CDHSG Registry) born from 2007 to 2018 were analyzed.

RESULTS
5730 patients with a posterolateral CDH were entered into the registry. Omphalocele was present in 36 (0,62%). When comparing CDH with Omphalocele (CDH+O) to CDH without (CDH-), CDH+O were born at younger gestational age, had lower APGAR scores, but received ECMO less often. 53,8 % of the CDH+O had other associated anomalies.

Left vs right side or defect size did not differ but CDH+O needed a patch more frequently. CDH+O had surgical repair later, had a higher rate of non-repair (53%) and lower survival (41%). Those who underwent surgical repair had survival of 76%.

DISCUSSION
CDH associated with Omphalocele is a more severe condition with higher mortality and morbidity.

Table 1	CDH- (n=5694)	Bochdaleck CDH+ Omphalocele (n=36)	p values
	%	%	
Bw (median, IQR)	3.0 (2.6-3.3)	2.5 (2.1-3.0)	<0,0001
ECMO	29,1	13,9	0,03
Prenatal Dx	69,7	63,9	ns
APGAR 1 (median, IQR)	5 (3-7)	3 (1-4)	0,004
APGAR 5 (median, IQR)	7 (5-8)	5 (3-8)	0,001
Chromosomal anomalies	6,6	13,9	0,04
Major cardiac anomalies	8	11,1	ns
Other anomalies	14,1	27,8	0,001
Patch repair	44,8	36,1	ns
Not repair	16,1	52,8	<0,0001
Survival	71,4	41	<0,0001
LOS (median, IQR)	36 (22-68)	102 (42-132)	<0,0001

TH06: THE OUTCOME OF VERY LOW AND LOW BIRTH WEIGHT INFANTS WITH ESOPHAGEAL ATRESIA: THE DATA OF TURKISH ESOPHAGEAL ATRESIA REGISTERY

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AIM
The data of Turkish Esophageal Atresia Registry (TEAR) was evaluated to define the outcome of very low birth weight (VLBW) and low birth weight (LWB) infants with esophageal atresia.

METHODS
The data of 389 cases registered by 23 centers between 2014-2018 was evaluated for demographic features, prenatal findings, associated anomalies, surgical treatment and outcome. Patients were enrolled in three groups according to their birth weights (VLBW (<1500g), LWB (1500-2500g), normal [NBW, >2500g]).

RESULTS
The demographic features, prenatal findings, incidence of associated anomalies in VLBW (n=37, 9.5%), LBW (n=165, 42.5%) and NBW (n=187, 48.0%) are listed in Table1. Six of the VLBW cases were extremely LBW (infants <1000g). Primary anastomosis was achieved significantly higher in NBW (86.6%) cases than LWB (72.7%) and VLBW (59.5%) cases ($p<0.05$). The number of cases with tension-free anastomosis, rate of fistula recanalization and esophageal strictures requiring esophageal dilatation were similar in all groups ($p>0.05$). Higher number of NBW patients had full oral feedings and 14.2% of VLBW and 13.3% of LBW cases were still on tube feeding ($p<0.05$). The overall mortality rate was significantly higher in VLBW and LBW cases when compared to NBW patients (48,6%, 24.2%, 8.6% respectively, $p<0.05$).

CONCLUSION

The national data of TEAR demonstrates promising outcomes in VLBW and LBW infants. Although, oral feeding parameters are still better in NBW infants, long-term complications such as fistula recanalization and esophageal strictures, and weight - height values in one-year period are similar in all birth weight groups.

Table 1. Demographic features, prenatal findings, associated anomalies, types of atresia, surgical results and outcome.

Parameters	VLBW (n=37)	LBW (n=165)	NBW (n=187)	p
Gender (M/F)	17/20 (1:1.18)	82/83 (1:1.01)	106/81 (1.31:1)	ns
Birth weight (mean ± SD, g)	1251 ± 216.3	2040 ± 310.8 [a]	2944 ± 354.5 [b]	**<0.05**
Height (mean ± SD, cm)	38.25 ± 4.1	44.97 ± 3.9 [a]	47.66 ± 3.8 [b]	**<0.05**
Gestational week	31 [29-32]	35 [34-37] [a]	38 [37-39] [b]	**<0.05**
Possible prenatal diagnosis	11 (29.7%)	57 (34.5%)	46 (24.6%)	>0.05
Polyhydramnios	14 (37.8%)	71 (43.0%)	79 (42.2%)	>0.05
Associated anomalies	27 (73.0%)	123 (74.5%)	113 (60.4%) [b]	**<0.05**
Type of the atresia				
A	9 (24.3%)	31(18.8%)	18 (9.6%)	<0.05
B	1 (2.7%)	9 (5.5%)	2 (1.1%)	
C	26 (70.3%)	123 (74.5%)	154 (82.4%)	
D	1 (2.7%)	1 (0.6%)	7 (3.7%)	
E	--	1 (0.6%)	6 (3.2%)	
Primary surgical technique				
Thoracotomy	21 (56.8%)	128 (77.6%)[a]	150 (80.2%) [a]	**<0.05**
Thoracoscopy	1 (2.7%)	5 (3.0%)	17 (9.1%) [a]	**<0.05**
Eso-esophageal anastomosis(Yes)	22 (59.5%)	120 (72.7%)	162 (86.6%) [b]	**<0.05**
Tension-free anastomosis	13 (59.1%)	83 (69.2%)	123 (75.9%)	>0.05
Patients without full-oral feeding	4 (18.8%)	22 (18.3%)	10 (6.2%) [b]	**<0.05**
Tube feeding	3 (13.3%)	17(14.2%)	7 (4.3%) [b]	**<0.05**
Fistula recanalization	2 (9.1%)	2 (1.7%)	1 (0.6%)	>0.05
Symptomatic anastomosis stricture	6 (27.3%)	24 (20.0%)	27 (16.7%)	>0.05
Esophageal dilatation	6 (27.3%)	25 (20.8%)	26 (16.0%)	>0.05
Weight at 6 months of age (mean ± SD, g)	5880 ± 1297	5991 ± 1291	6021 ± 1506	>0.05
Height at 6 months of age (mean ± SD, cm)	61.2 ± 5.1	61.4 ± 5.6	61.6 ± 6.7	>0.05
Weight at 1 year of age (mean ± SD, g)	8824 ± 1367	8862 ± 2153	9072 ± 1694	>0.05
Height at 1 year of age (mean ± SD, cm)	73.6 ± 3.5	72.4 ± 8.2	71.6 ± 8.4	>0.05
Death rate after tension-free anastomosis	4 (30.7%)	18 (21.7%)	4 (3.3%) [b]	>0.05
Overall death	18 (48.6%)	40 (24.2%)[a]	16 (8.6%) [b]	**<0.05**

a Different from Group VLBW ($p < 0.05$) **b** Different from Group VLBW and Group LBW ($p < 0.05$)

TH07: OXIDATIVE MARKERS IN EXHALED BREATH CONDANSATE OF PATIENTS WITH ESOPHAGEAL ATRESIA AND TRECHEOESOPHAGEAL FISTULA AND ITS RELATION WITH RESPIRATORY PROBLEMS

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AIM

A prospective study was conducted to evaluate the levels of oxidative markers in exhaled breath condensate (EBC) of patients with esophageal atresia and tracheoesophageal fistula (EA-TEF).

METHODS

Patients operated for EA-TEF were evaluated for age, sex, types of anomaly, surgical treatment, and respiratory problems. A 500-1000 µl EBC was obtained from EA-TEF cases and healthy controls (CG, with no history of respiratory problems, n=26) with Ecoscreen. Oxidative markers; glutathione (Glu), 8-isoprostane (8-iso) and cysteinyl-leukotriene (CL) levels in EBC were analyzed with ELISA and the results were compared between groups. Levels of oxidative markers were correlated with respiratory problems and gastroesophageal reflux (GER) treatment.

RESULTS

Twenty-nine EA-TEF cases with a mean age of 8.8 years (3-14 years) were included. Male:female ratio was 16:13. Distal fistula (n=27), isolated atresia (n=1), and proximal-distal fistula (n=1) were the type of anomalies. The median levels of Glu, 8-iso and CL in EA-TEF cases and CG were listed in Table. Glu levels were significantly decreased in EA-TEF patients compared to CG (p=0.01). When EA-TEF cases on proton-pump inhibitor (PPI) treatment and without PPI compared, patients without PPI had significantly higher levels of CL (Table, p=0.04). Also, patients with fundoplication had lower levels of 8-iso when compared to those without fundoplication (p=0.02).

CONCLUSION

In patients with EA-TEF, Glu levels were significantly decreased in EBC. Decreased levels of CL in patients on PPI and 8-iso in patients with fundoplication suggest that oxidative stress in the breath condensate of patients may be related with GER and its treatment.

Table. Median levels of Glu, 8-iso and CL in EBC (* p values less than 0.05 is considered as significant).

Patients	Glu (nM/ml)	8-iso (pg/ml)	CL (pg/ml)
EA-TEF	1,03 (0,93-1,15)	38,8 (32,03-76,2)	30,44 (20,17-61,3)
Control	1,23 (1,13-1,36)	66,3 (33,5-106,7)	56,9 (27,4-80,1)
	p = 0.001*	p> 0.05	p> 0.05
EA-TEF on PPI	1,04 (0,97-1,13)	41,8 (31,4-83,8)	21,7 (18,6-48,1)
EA-TEF without PPI	1,01 (0,7-1,19)	34,1 (32,2-63,1)	41,1 (22,5-83,1)
	p> 0.05	p> 0.05	**p = 0.04***
EA-TEF with fundoplication	1,08 (1,02-1,15)	34,1 (29,9-47,2)	21,9 (19,6-52,9)
EA-TEF without fundoplication	1 (0,68-1,15)	59,5 (42,2-86,3)	34,6 (20,2-70,9)
	p> 0.05	**p=0.02 ***	p> 0.05

TH08: PERCUTANEOUS TRACHEOSTOMY BY GRIGGS TECHNIQUE UNDER RIGID BRONCHOSCOPIC GUIDANCE IS SAFE AND FEASIBLE IN CHILDREN: LONG TERM OUTCOMES

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OBJECTIVE

The aim of this study is to report prospective data of pediatric cases that underwent percutaneous tracheostomy (PT) to show that PT has acceptable long term outcomes in children.

PATIENTS AND METHODS

PT was done in 74 consecutive pediatric intensive care unit patients. Demographic data, indications, complications and long term outcomes were recorded prospectively. Initial 6 PT was done by Giaglia technique whereas the Griggs technique was used in the consecutive 68patients.

RESULTS

Seventy-four patients with mean age of 48,2 months(1month-17years) underwent PT. 18(24%) were under one year.The mean weight of children was 11,2 kg(2,8-71kg). The only major complication was perforation of esophagus (n=1;1,7%) which was recognized early and immediately repaired by cervical approach. This complication occurred in the 6th case done with the Giaglia technique. After conversion to the Griggs technique no major complication was encountered in the consecutive 68 procedures. The mean period of follow up was 24 months(3month-8years). Decannulation was tried on six patients. Four of them tolerated decannulation and discharged on the next day. Narrowing of the stoma site and tracheostomy site granuloma developed in 5.4%(n=4), 8.1%(n=6) of the patients, respectively.

CONCLUSION

PT done by Griggs technique under rigid bronchoscopic guidance is a safe and easy procedure and a less invasive alternative to surgical tracheostomy even in small infants. Preservation of the tracheal cartilage and creation of a smaller tracheal opening compared to surgical tracheostomy, therefore the possibility of decannulation without surgery is the major advantage of the procedure.

TH09: SHORT INTERVAL STAGED THORACOSCOPIC SURGICAL REPAIR WITHOUT GASTROSTOMY FOR LONG GAP ESOPHAGEAL ATRESIA

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AIM

Long gap esophageal atresia is associated with high morbidity and mortality rates. We can obtain an early anastomosis by progressive traction surgery. We propose to do it by thoracoscopic surgery without gastrotomy, and to reduce the interval stages to 5-7 days.

METHODS

Thoracoscopy is done with 3 ports, the patient in prone position, non-selective intubation, CO_2at 4 mmHg and 0.5-1 L/min of flow. For the first stage we use sliding sutures and clips to prevent esophageal tearing and preservation of the azygos vein. Next stage is scheduled 5 to 7 days later. At the second stage,if both pouches cross over, the anastomosis is done. If there is still tension, a sliding suture brings both ends closer and clips are again applied. A third stagefive to seven days later is planned to repeat the procedure.

RESULTS

We treated 3 patients, two type A atresia (33 and 36 weeks of gestation, 1300 and 3200 grams) and one type C (32 weeks, 1370 grams). Esophageal anastomosis was done 1-3 weeks after birth. Gastrostomy was avoided and in two patients oral feeding started one week after anastomosis. In one, leaking was observed, so oral feeding started 2 weeks after anastomosis. Esophageal dilatations (n=2-3) were required in 2 patients.

CONCLUSIONS

Repetitive thoracoscopy at shorts intervals in the neonatal period allows a tension free anastomosis of the esophagus in long gap type esophageal atresia. The absence of a gastrostomy prevents the appearance of complications and facilitates the ascent of the esophagus.

TH10: GASTRIC VS. TRANSPYLORIC NUTRITION IN NEONATES WITH CONGENITAL DIAPHRAGMATIC HERNIA

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AIM OF THE STUDY

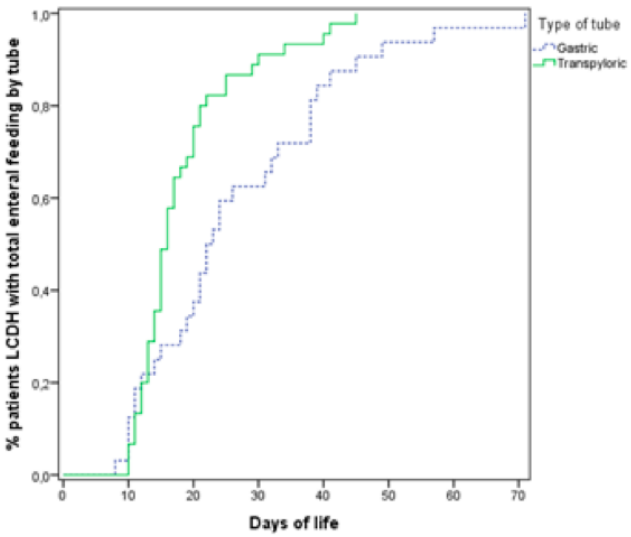
To compare the time to accomplish total enteral nutrition (TEN) in patients with congenital diaphragmatic hernia (CDH) fed with gastric (GT) vs. transpyloric tube (TPT).

PATIENTS AND METHODS

Retrospective review of patients with left CDH treated in our center between 2007 and 2014. Demographic, clinical, treatment and outcome variables were collected. In order to evaluate factors that determine the time to accomplish TEN, a lineal regression model was performed.

MAIN RESULTS

83 patients were identified, 37 with GT and 46 with TPT. Both groups were comparable in terms of demographic and clinical variables, except a trend to have a higher severity in the GT group. TPT patients accomplished TEN significantly sooner than GT patients: 18.4±8.4 vs. 26.7±15.0 days, p=0,007.



The lineal regression model was designed with the following variables: type of feeding tube (GT vs. TPT), a clinical variable of severity, the clinical score of CDH Study Group and the type of diaphragmatic defect. In this model, the type of feeding tube is the only variable that depended on the physician.

The use of TPT instead of GT decreased the time to accomplish TEN in 8.39 days (95% CI: -14.76 to -2.02), R^2 0.383, p<0.001.

Conclusions:

The use of TPT vs. GT decreases the time to accomplish TEN in patients with left CDH.

TH11: NEW SCORING SYSTEM TO PREDICT FOREIGN BODY ASPIRATION IN CHILDREN

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AIM
To propose a new scoring system to predict foreign body aspiration (FBA) in children.

METHODS
Children who underwent bronchoscopy for FBA were evaluated for age, sex, history of aspiration, physical examination, radiological findings and results of bronchoscopy retrospectively. A new proposed FBA scoring including statements about history, physical and radiological findings was applied to all patients to define a total score (Table 1). The results of each statement and total FBA score was compared according to bronchoscopy findings. The sensitivity and specificity of FBA score and cut-off values of total FBA score to predict positive cases were evaluated.

RESULTS
Totally 720 patients with a male to female ratio of 227:133 were included. FBA was noted in 52.1% (n=375) of cases. When the scoring system compared with the existence of FB, the patient history and the physical examination parameters had no statistical significance to predict positive cases ($p>0.05$). The existence of FB was significantly associated with radiological findings and total FBA score ($p<0.001$). The sensitivity, specificity and cut-off values of history, physical, radiological findings and total score are listed in Table 1. The total score 5.5 has sensitivity and specificity of 74% and 74% to predict FBA in children.

CONCLUSION
The results of this study suggest that the proposed scoring system can be utilized to predict FBA in children. The total scores higher than 5.5 is highly predictive for FBA. Although, radiologic findings have strong parameters for positive bronchoscopy, the history of FBA has no diagnostic utility.

Table 1. Foreign Body Aspiration Score

Statements	Score	Area under the ROC curve	Cut-off value	Sensitivity	Specificity	Positive predictive value	Negative predictive value
History of aspiration		0.498	NA	NA	NA	NA	NA
-No history	0	p=0.94					
-Recurrent RTI	1						
-Cough	2						
-Sudden onset respiratory difficulty	3						
- Respiratory difficulty during feeding	4						
-Witnessed aspiration	5						
Physical examination		0.754	1.5	0.59	0.83	0.76	0.65
-Normal findings	0	p=0.018					
-Wheezing, stridor	1						
-Decreased breath sounds on one side	2						
-Cyanosis, respiratory insufficiency	3						
Radiological evaluation		0.766	0.5	0.77	0.74	0.77	0.75
-Normal chest X-ray	0	p<0.001					
-Hyperinflation on one side	1						
-Mediastinal shift	2						
-FB in chest CT	3						
-Opaque FB on chest X-ray	4						
Total score		0.779	5.5	0.74	0.74	0.76	0.72
		p<0.001					

Abbreviations: RTI: respiratory tract infection, NA: not applicable (since p>0.05), FB: foreign body, CT: computed tomography

TH12: LUNG FUNCTION IN INFANTS WITH CONGENITAL PULMONARY MALFORMATION

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AIM OF THE STUDY
Patients operated on for congenital pulmonary malformations (CPM) have excellent survival rates. Little is known about their early lung function. Our aim was to describe post-operative lung function in infants with CPM.

METHODS
Intants with CPM born between 2009 and 2015 and followed in a dedicated outpatient program were included in the study. At least ten successive tidal flow/volume curves were obtained and analysed. The mean values of tidal volume (Vt) respiratory rate (RR), time to peak tidal expiratory flow as a percentage of total expiratory time (tPTEF/te), time of expiratory flow at 50% over time of inspiratory flow at 50% (TEF50/TIF50) were calculated. We compared operated and non-operated patients, and among the operated ones, asymptomatic vs symptomatic patients.

RESULTS
We included in the study 48 patients with CPM, 8 of them did not undergo surgery. Age at LFT was 11.5 months (4-30). Twelve operated patients had one or more clinical or radiological abnormality. Table shows main findings. Obstructive/restrictive patterns were seen in 4 asymptomatic patients and 3 symptomatic patients (p=ns). We found no differences in the analysed parameters between operated and non-operated patients and symptomatic and asymptomatic patients.

CONCLUSION
In our cohort of CPM patients, surgical intervention did not seem to have an impact on medium term lung function. In operated CPM patients, no significant difference of LFT was seen between symptomatic and asymptomatic patients. All patients with CPM should undergo follow-up LFT, regardless their clinical manifestations.

LFT	Non-operated patients	Operated patients	
		Asymptomatic (28 pts)	Symptomatic (12 pts)
Vt (ml/kg)	7.8 (5.7-6.8)	8.9 (5.2-20.5)	9 (6-12)
RR (bpm)	33.8 (21-46)	39 (21-63)	37 (21-62)
tPTEF/tE (%)	24 (18-31)	36 (12-86)	30 (16-90)
TEF50/TIF50	0.71 (0.66-.078)	0.88 (0.45-1.1)	0.89 (0.67-1.3)

Non-operated vs operated patients: p=ns for all variables; in operated patients, asymptomatic vs symptomatic patients: p=ns for all variables

UR01: EPIGENETIC CODE OF LONG NON-CODING RNAs AFTER CURATIVE GNRHa TREATMENT FOR CRYPTORCHIDISM-INDUCED INFERTILITY

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AIM OF THE STUDY
The discovery of long non-coding RNAs (lncRNR) has revolutionized our conception of gene expression regulation. Our working hypothesis is that curative GnRHa treatment stimulates lncRNAs to control mRNAs via transcription interference thus triggering germ cell translation into Ad spermatogonia (stem-cells for spermatozoa)

METHODS
During orchidopexy for bilateral cryptorchidism (median age 18.5 months), biopsies are obtained for semi-thin sections and RNA-Sequence analysis. The absence of Ad identifies high infertility risk patients, who are randomized for treatment either with GnRHa (gonadotropin releasing hormone agonist) or surgery "only". Randomization of patients to be treated was unbiased by any parameter. Eight biopsies, four before and four after 6 months GnRHa treatment, were compared to 6 samples, three before and three after 6 months of "surgery only". Ethical approval by Regional Biomedical Research Ethics Committee.

MAIN RESULTS
84 lincRNAs (long intergenic non-coding) as well as 46 antisense lncRNAs that show >2.0-fold change after GnRHa treatment were analyzed. We observed elevated signals for HOTAIR, DLX6-AS1, AIRN, LINC00922, LINC00221, LINC01249, LINC1132, LINC01446 LINC00701, and LINC00282. AIRN and HOTAIR are involved in histone modification and DLX6 in the control of testosterone secretion. Noticeably, surgery "only" failed to stimulate lncRNA expression.

CONCLUSIONS
lncRNAs cooperate with chromatin modifying enzymes to promote epigenetic activation of genes. GnRHa treatment acts as a surrogate for mini-puberty and stimulates lncRNAs that trigger Ad spermatogonia differentiation. Here, we provide additional molecular evidence why infertility and azoospermia in cryptorchidism resulting from defective mini-puberty cannot be corrected with successful orchidopexy alone.

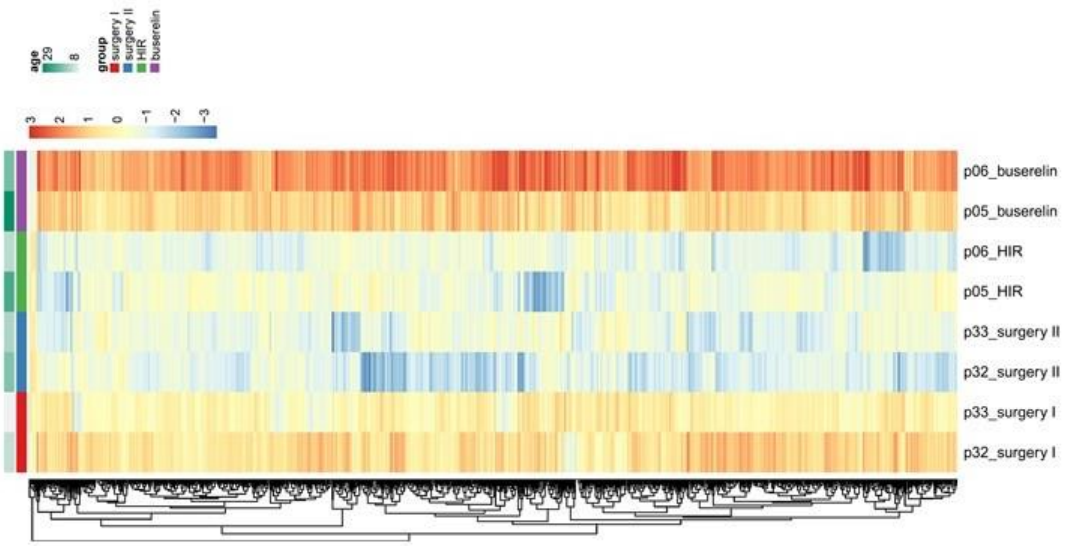

Fig. 1. Heatmap showing LincRNA gene expression.

UR02: OCUPATIONAL EXPOSURE TO ENDOCRINE DISRUPTING CHEMICALS IN HYPOSPADIAS AND CRITPORCHIDISM DEVELOPMENT

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AIM OF THE STUDY

Endocrine disrupting chemicals (EDC) are exogenous agents that are capable of altering the endocrine system functions, including the regulation of developmental processes. The aim of our study was to investigate the association between EDC exposure and other parental factors in the aetiology of hypospadias and cryptorchidism.

METHODS

A case-control study. Cases were infants between 6 months and 14 years of age with hypospadias or cryptorchidism attended in our hospital over a period of 18 months and controls were infants with the same range of age without any urological problem. Data on parental occupational exposure to EDC and other sociodemographic variables were collected by face-to-face interviews. Estimated odds ratios (OR) with 95% confidence intervals (CI) and logistic regressions were used for statistical analyses.

MAIN RESULTS

420 patients were studied, 210 cases (107 hypospadias/103 cryptorchidism) and 210 controls. Percentage of mothers aged more than 35 was significantly higher in cases group (42.4% *versus* 30.5%;p=0.33). An increased risk in mothers who consume antiabortive (OR=5.40 [95% CI: 1.40-38.5]) or other drugs (OR=2.02 [95% CI: 1.31-3.16]) during pregnancy was observed. Significant differences were observed between cases and controls regarding maternal and paternal occupational exposure to EDC, adjusted OR were 4.08 [95% CI: 2.03-8.96] and 3.90 [95% CI: 2.41-6.48] respectively. In cases group, an increased risk was also observed in smoking fathers (OR=2.0 [95% CI: 1.33-2.99]) and fathers with urological problems (OR=2.31 [1.15-4.90]).

CONCLUSIONS

Parental occupational exposure to EDC may increase the risk of developing cryptorchidism and hipospadias. The most frequent substances of exposure were phthalates.

UR03: DOES BLADDER CAPACITY INFLUENCE RENAL FUNCTION IN CHILDHOOD POSTERIOR URETHRAL VALVES (PUV)?

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AIM OF THE STUDY
Renal function (RF) in posterior urethral valves (PUV) may deteriorate through childhood and is influenced by various factors. We hypothesized that having an abnormal bladder capacity (BC) may influence it negatively.

METHODS
This is a single-centre, retrospective review of a longitudinal cohort of PUV boys with assessment of BC (non-invasive urodynamic study) and RF (eGFR) during childhood.

Linear regression analysis of BC/expected BC (EBC) % ratio and change in eGFR (ΔeGFR) measured at 5 and 10 years of age was performed.

EBC was calculated as per ICCS standardization (1).

MAIN RESULTS
30 children had complete data and were analysed.

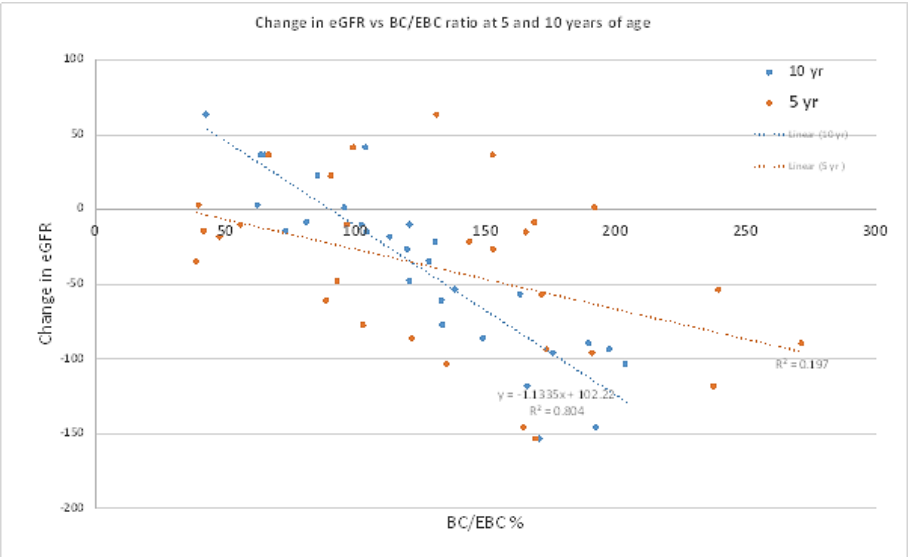
Median BC/EBC% at 5 years was 120.4 (42-248) and at 10 years was 130.6 (26-272).

Median eGFR at 5 years was 96.57 (17.08 - 144.95) ml/min/1.73m² and at 10 years was 78.18 (32.11 - 102.83) ml/min/1.73m².
Median ΔeGFR is -11.16.

Linear regression analysis shows that increasing ratio BC/EBC% at 10 years significantly correlates with negative ΔeGFR (R^2=0.804) (see graph).

CONCLUSION:
In our population the larger the bladder capacity at 10 years of age, the greater the negative change in renal function between 5 and 10 years. This is the first longitudinal study to demonstrate that the bladder capacity plays a part in renal deterioration in PUV boys.

1 Austin PF et al. J Urol 2014; 191: 1863-1865



UR04: LOWER URINARY TRACT DYSFUNCTION; IS THERE A UNIQUE SYMPTOM?

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AIM OF THE STUDY
Lower urinary tract dysfunction (LUTD) is a common disorder which is reported in 20% of school-aged children. There is currently no consensus in the diagnosis of these children, due to the subjectivity of the symptoms. In this study, we aimed to investigate the relationship between each LUTD and its associated symptom, using uroflowmetry/electromyography (UF/EMG) as a diagnostic tool.

METHODS
Hospital records of patients admitted due to LUT symptoms between 2015 and 2018 were explored. Data were analyzed in 4 groups per voiding dysfunction symptom score, bladder diary, Bristol stool form scale, and UF/EMG which were overactive bladder (OAB), dysfunctional voiding (DV), underactive bladder (UAB) and primary bladder neck dysfunction (PBND), respectively.

MAIN RESULTS
There were 189 children (median age 7.1 years, range 5-13 years) of which 78 (56,1%) were female. The primary symptoms were summarized in Table 1. The statistically significant difference between groups could only be proved hesitancy and constipation (p<.001). Hesitancy was present in 89.4% with PBND and constipation was present in 78.6% of patients with DV.

CONCLUSION
While certain symptoms are often presumed by clinicians to imply specific diagnoses, this study demonstrated that hesitancy and constipation are the only symptoms that are unique to LUTD. It is highly recommended that repetitive UF/EMG should be performed every patients with LUTD instead of relying on subjective symptomatology in the initial assessment in conjunction with Bristol stool scale.

Table 1: Presenting symptoms of four lower urinary tract conditions

	OAB	DV	UAB	PBND
Patients	91	61	18	19
Urinary frequency	47(51.6%)	32(52.4%)	4(22.2%)	5(26.3%)
Urgency	59(64.8%)	38(62.2%)	6(33.3%)	7(36.8.8%)
Day time incontinence	54(59.3%)	38(62.2%)	6(33.3%)	5(26.3%)
Night time incontinence	24(26.3%)	13(21.3%)	4(22.2%)	3(15.7%)
Holding maneuvers	53(58.2%)	33(54%)	4(22.2%)	5(26.3%)
Hesitancy	0(0%)	9(14.7%)	4(22.2%)	17(89.4%)
Intermittency	23(25.2%)	31(50.8%)	10(55.5%)	4(21%)
Constipation	22(24.1%)	48(78.6%)	5(27.7%)	3(15.7%)
PVR >20 ml, 7-13 years >10 ml, 5-6 years	20(22%)	30(49.1%)	10(55.5%)	4(21%)
Actual/Real BC decrease	37(40.6%)	19(31.1%)	0(0%)	3(15.7%)

UR05: GAIT ANALYSIS IN BLADDER EXSTROPHY PATIENTS IN LATE FOLLOW-UP PERIOD

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INTRODUCTION
Due to skeletal malformations in exstrophy-epispadias complex (EEC), walking problems can be seen in late childhood and adolescence. The aim of this study is to investigate walking problems in late period.

PATIENTS AND METHODS
In 18 patients (age:20±6 years), who were operated and followed for EEC, 3D Gait Analysis was performed in Spastic Children Foundation. Pelvic osteotomy has been performed in 3 of 18. The gait phases were analyzed, by performing kinematics and kinetics of the trunk, hip, knee, ankle angles. The values of the patients in the initial contact(ICP) and preswing phases(PP) were compared with the normal values.

RESULTS
The following findings were detected:
-There was a significant increase in bilateral hip abduction angles in the PP which makes about 5 degree difference on both sides.(p:0.001 p<0.001)
-The moments on both sides increased significantly in the ICP.(p<0.001 p <0.001)
-The ICP and PP of hip rotations on both sides were higher than the normal values(p:0.001 p:0.013 p<0.001 p:0.012)
-The increased angular differences between the phases before İCP and PP showed an increased rotation capacity in comparison to normal.
-No significant difference was observed in results between patients with or without osteotomy.

CONCLUSION
In EEC patients, significant changes were observed in pelvic anatomy, and gait analyses. But these changes did not effect functional status, due to the adoptive status in late period. There was no apparent difference between the osteotomy and non-osteotomy groups. However number of patients was small to make significant comment.

UR06: FERTILITY POTENTIAL IS IMPAIRED IN AT LEAST 15% OF NON-SYNDROMIC CRYPTORCHID BOYS DESPITE ORCHIDOPEXY WITHIN THE FIRST YEAR OF LIFE

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AIM OF THE STUDY

An epidemiological study of a 350.835 male cohort recently showed, that even boys having orchidopexy performed according to guidelines within the first 18 months of life had an increased risk of the need for using assisted reproductive technologies to father children in adulthood. Later treatment resulted in more than 21% decreased likelihood of paternity. The aim of our study was to explain such findings by evaluating the hormonal profile and testicular histopathology of cryptorchid boys <1-year old.

METHODS

From 2011–2018 432 consecutive boys were operated for non-syndromic cryptorchidism up to 1 year of age (median: 9 months). At orchidopexy we evaluated follicle stimulating hormone, luteinizing hormone and inhibin-B in serum and number of germ cells per tubule cross-section (G/T) and number of Ad Spermatogonia per tubule cross-section (Ad-S/T) in testicular biopsies. All values of the investigated parameters were compared to our normal materials.

MAIN RESULTS

Serum inhibin-B level was below normal range in 17%. One third of these boys also had low G/T. Totally 30% of the boys had G/T values below normal range. Furthermore, 15 % of the boys had Ad-S/T below normal range. In 80% of these cases the G/T was also below normal range.

CONCLUSIONS

Evaluating the hormonal profile and testicular histopathology should be mandatory in cryptorchid boys when performing orchidopexy. This is the only way to identify at least 15% of the patients who might need supplementary treatment options as adjuvant hormonal therapy or germ-cell cryopreservation.

UR07: THE ROLE OF ANTIBIOTIC PROPHYLAXIS IN THE PREVENTION OF URINARY TRACT INFECTIONS AFTER A VOIDING CYSTOURETHROGRAPHY: A SURVIVAL STUDY

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AIM OF THE STUDY

Antibiotic prophylaxis (AP) is used to prevent febrile urinary tract infections (fUTI) after a voiding cystourethrography (VCUG), but its usefulness is not clear.

METHODS

A prospective cohort study was carried out with all the pediatric patients who underwent a VCUG between 2016-2018 in our center. We recorded: AP, gender, age, vesicoureteral reflux (VUR) grade, hydronephrosis grade, distal ureter diameter, posterior urethral valves (PUV), neurogenic bladder,history of fUTI, fUTI after VCUG, date of fUTI and date of last control. Survival analyses were performed taking fUTI 1 week and 4 weeks after VCUG as failures. Backward-forward stepwise multivariate Cox regression analyses were performed and Hazard Ratios (HR) calculated.

MAIN RESULTS

359 patients underwent a VCUG, 15 were lost. Out of 344 patients, 4 developed a fUTI the first week (1.2%) and 19 during the first month (5.5%). Multivariate Cox regression showed: PUV (HR=62.3, 95%CI:3.7-1050.3;p=0.004) and neurogenic bladder (HR=13.7, 95%CI: 1.2-160.2; p=0.037) were independent risk factors to develop a fUTI during the first week (p=0.044;Harrell's C=0.89). Antibiotic prophylaxis (HR=5.1,95%CI: 1.1-23.0;p=0.034), PUV (HR=13.4, 95%CI: 2.82-63.2;p=0.001) and history of fUTI (HR=3.3, 95%CI: 1.03-10.36;p=0.046) were independent risk factors for fUTI during the first month (p=0.0012;Harrell's C=0.76).

CONCLUSIONS

Our study shows that antibiotic prophylaxis has not a protective effect during the first week after a VCUG, but instead it is an independent risk factor to develop a fUTI the first month. We suggest performing a randomized controlled trial in order to establish the real role of prophylaxis antibiotic in VCUG.

UR08: TESTICULAR-EPIDIDYMAL NON-FUSION IN CRYPTORCHIDISM: A SYSTEMATIC REVIEW AND META-ANALYSIS

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AIM OF THE STUDY
Testicular-epididymal non-fusion (TENF) is associated with cryptorchidism. It involves the abnormal separation of the epididymis from the testis.The purpose of this review was to determine the prevalence of TENF and to assess its relationship with cryptorchidism.

METHODS
Systematic review of published literature between 1980 and 2018 was performed. Meta-analysis (Freeman-Tukey transformation) with random-effect was used to calculate the overall TENF proportion reported as percentage [95% confidence interval (CI)] and odds ratio (OR) [95% CI]. Heterogeneity was assessed using the I^2-value; I^2>50% represents significant heterogeneity. P value <0.05 was considered significant.

RESULTS
A total of 8 studies (3 prospective cohort studies, 5 retrospective reviews) with 4914 children (5293 testes) were identified. The table below displays the prevalence of TENF and its subtypes. Tail-NF was the most common followed by head-NF and complete-NF. Intrabdominal testes were more likely to exhibit TENF than inguinal testes (OR 5.7 [3.7-9.0], p<0.001, I^2 63.6%, p=0.04). None of the articles reported on post-operative outcomes.

	Percentage [95% CI]	I^2-value	P-value
TENF	21% [11.5-32.3]	99%	0.0001
Tail-NF	10% [4.9-17.5]	98%	0.0001
Head-NF	6% [2.6-12.0]	97%	0.0001
Complete-NF	5% [3.4-7.9]	90%	0.0001

CONCLUSIONS
This review indicates that TENF is present in almost one-quarter of cryptorchid testes. There is, however, significant heterogeneity in reporting this finding. TENF is also strongly associated with abdominal cryptorchidism. The clinical significance of TENF remains unclear. Further research is required to improve the reporting of TENF and determine its impact on long-term testicular development and function.

UR09: ULTRASOUND WITHOUT SCINTIGRAPHY MAY BE SUFFICIENT FOR MONITORING SELECTED PATIENTS AFTER PYELOPLASTY WITHOUT PYELOREDUCTION

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AIM OF STUDY

It has been suggested that ultrasound could replace renal scintigraphy in the follow-up of children after pyeloplasty. A decrease in renal-pelvis antero-posterior diameter (D-APD) was postulated to be indicative of sufficient pelvic drainage. Today, pyeloplasty is performed with varying degrees of pyeloreduction and this may affect changes in D-APD. We have demonstrated that pyeloreduction during pyeloplasty is not necessary. Therefore, we aimed to evaluate the accuracy of ultrasound in the follow-up of patients who underwent pyeloplasty without pyeloreduction.

METHODS

Data from all children (0-16 years) who underwent pyeloplasty without pyeloreduction in our institution from 2007-2018 were analysed retrospectively (n=147). For 73 patients data from pre- and post-operative ultrasound and MAG3-scintigraphy were available. Two groups were compared regarding pre- versus postoperative renal clearance and need for reoperation: D-APD reduction by ≥10% versus D-APD by <10%.

MAIN RESULTS

Fifty-five of 73 patients had a D-APD≥10%. MAG3-scintigraphy confirmed sufficient clearance in all except one in who suffered from vesicoureteral reflux. None of these patients needed reoperation. Eighteen patients had a PD-APD<10%. Eleven of these showed free clearance on scintigraphy, 7 presented with clearance insufficiency out of whom 5 required reoperation. The positive predictive value of a D-APD ≥10% was 1. The negative predictive value of a D-APD<10% was only 0,39.

CONCLUSION

In patients after pyeloplasty without pyeloreduction who have a decrease in renal-pelvis antero-posterior diameter of more than 10% ultrasound appears to be sufficient for follow-up. Renal scintigraphy seems to be indicated only in cases with a D-APD<10%.

UR10: ROBOT-ASSISTED EXTRAVESICAL URETERAL REIMPLANTATION (REVUR) FOR BILATERAL VESICO-URETERAL REFLUX IN CHILDREN: RESULTS OF A MULTICENTRIC INTERNATIONAL SURVEY

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AIM OF THE STUDY
This multi-institutional study aimed to report the outcome of robot-assisted extravesical ureteral reimplantation (REVUR) in children with bilateral vesico-ureteral reflux (VUR).

METHODS
Forty-four patients (19 girls and 25 boys), who underwent bilateral REVUR for bilateral primary VUR in 4 centers of Pediatric Robotic Surgery over a 5-year period, were included. Exclusion criteria were: previous failed open surgery, secondary VUR, megaureters requiring tapering and unilateral VUR. Patients' average age was 6.7 years. The pre-operative VUR grade was III in 22.7%, IV in 50% and V in 27.3%. Thirty-one patients (70.4%) presented loss of renal function and 12 (27.3%) had a duplex system.

MAIN RESULTS
The average robot docking time was 11.6 minutes (range 5-20). The average console time was 158.3 minutes (range 105-190). No conversions neither intra-operative complications were recorded. The average analgesic requirement was 32 hours (range 24-48). The average hospitalization was 2.4 days (range 1-4). Overall surgical success was 95.4%. We recorded 6 (13.6%) postoperative complications: 2 urinomas and 2 acute urinary retentions, managed conservatively (II Clavien) and 2 persistent VUR, successfully treated with endoscopic Deflux injection (IIIb Clavien).

CONCLUSIONS
Our results confirmed that REVUR is safe and effective also for treatment of bilateral VUR. The procedure is easy and fast to perform thanks to the Robot, that improves surgeon's dexterity, ergonomics and visualization. A future standard of REVUR for pediatric bilateral VUR can arise if high success rates and low complication rates will be further confirmed by larger series and longer follow-up.

UR11: URINARY AND SEXUAL FUNCTION AND FERTILITY IN MALES OPERATED FOR HIRSCHSPRUNG'S IN INFANCY: RESULTS FROM A LONG-TERM OUTCOMES STUDY

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AIM OF THE STUDY
We report long-term urological outcomes, fertility and sexual function in males with Hirschsprung's disease (HSCR).

METHODS
After ethical approval (17/LO/1692), males operated for HSCR at a single tertiary centre between 1978-2001 were invited to complete questionnaires on lower urinary tract symptoms (LUTS), sexual function and quality of life (SQoL-M).

MAIN RESULTS
69/164(43%) adult men contacted returned completed questionnaires, median age 29(18-40)years. Most had undergone Duhamel pull-through(75%;n=52). Further abdominal surgery, including 13 re-do procedures, was performed in 23(33%.) No iatrogenic urethral injuries were noted. 14/69 (20%) reported a previous urinary tract infection, but only 4(6%) during the past year. Any LUTS historically were reported in 35(51%;p=NS vs. controls), however LUTS >1/week were uncommon (6%;n=4.)

58/67(87%) had been sexually active, and 46(67%) were in stable relationships. 57/65(88%) had completely normal erections, and 59/65 (90%) normal orgasms. 2/65(3%) had retrograde ejaculations. Only one patient with complex psychiatric morbidity had erections insufficient for penetration. 25/58(33%) had attempted to conceive and 23(92%) had successful pregnancies (one requiring ICSI for oligospermia.) SQoL-M scores in sexually active patients were within normal limits (87(20.3).) All 5(9%) patients with low SQoL-M(<46) had a significant comorbidity.

CONCLUSION
Our results suggest significant long-term LUTS are uncommon after Duhamel pull-through with incidence similar to the normal population. Sexual function, fertility and sexual QoL are preserved in the vast majority. These results are relevant to counselling families of patients undergoing Duhamel pull-through.

UR12: PSYCHOLOGICAL PROBLEMS IN EXSTROPHY-EPISPADIAS COMPLEX PATIENTS AND THEIR PARENTS IN LATE FOLLOW-UP PERIOD

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INTRODUCTION
The social lives of exstrophy-epispadias compelx (EEC) patients and their parents are psychologically affected due to the problems such as incontinance, sexual problems and repetitive surgical procedures. We aimed to investigate these problems in EEC patients and their parents.

PATIENTS AND METHOD
27 EEC patients(mean age:20±6 years r:12-33 years) and their parents were evaluated in late period. Arizona Sexual Experience Scale, Temperament Evaluation of Memphis, Pisa, Paris and San Diego–autoquestionnaire (TEMPS-A), Beck's depression inventory, Maudsley Obsessional-Compulsive Inventory and Zarit Caregiver Burden Scale were performed. Pearson and Spearman correlation analyses were used.

RESULTS
According to the sexual life scale EEC patients were willing to have sexual relations with the opposite sex. The results were satisfactory in terms of sexual and physiological arousal. However, satisfaction scores were found to be lower than the expected. In patients with incontinance and genital cosmetic problems, candidates for further planned surgical procedures, depression and higher anxiety scales were detected. The parents had depressive mode due to ongoing stress for future operations and multiple clinical visits. In comparison with the other patients having various chronic disease, EEC group was in a better psychologic condition and this was attributed to the adoptive changes in long term.

CONCLUSION
Depressive temperament, anxiety can be seen in EEC patients and their parents due to various ongoing problems. Therefore, EEC patients should be evaluated in late period in case of any psychologic complaints. A collaboration with pediatric and adult psychiatrists is extremely helpful for adolescent EEC group.

HB01: LIVING DONOR LIVER TRANSPLANTATION IN CHILDREN: LESSONS LEARNED AFTER 25 YEARS OF EXPERIENCE

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AIM

Living donor liver transplantation (LDLT) is probably the most complex procedure in the field of liver transplantation. Its extensive use results of the shortage of pediatric cadaveric organs. This paper summarized our experience after 25 years performing this technique.

PATIENTS AND METHODS

We retrospectively reviewed our historical pediatric LDLT series. A total of 192 children (93 M, 99 F) received a LDLT between 1993-2018 [23 months (5-178), 10 Kg (4.3-61.5)]. Main indications were biliary atresia (124, 64.6%) and liver tumors (26, 13.5%). Non-compatible donor was successfully used in 6 (5%) children. Cava vein replacement using donor internal yugular vein was performed in 8 cases (4%) and Tanaka plasties for venous anastomoses in 22 (11.5%). Microsurgical arterial reconstruction was required in 185 (96.4%).

RESULTS

Forty patients (20.8%) required early reoperations (25 bile duct problems, 10 vascular causes, 5 intestinal bleeding/perforation). Radiologic procedures were necessary in 72 (37.5%; 25 biliary complications, 13 vascular problems, 20 both). Early graft loss occurred in 20 (10.4%; 5 HAT, 3 small-for-size syndrome, 3 portal thrombosis, 9 others). Rejection presented in 32 (16.7%) cases at some point, but only 4 (2.1%) lost their graft. PTLD occurred in 11 (5.7%). Re-transplantation rate was 9.9%. Patient and graft survival after 1 and 5 years were 93%/83% and 90%/78% respectively.

CONCLUSIONS

LDLT is a highly complex procedure, even for experienced centers. Interventional radiologic gained great importance in the management of biliary and vascular complications. Long-term results support the wide use of this technique in pediatric population.

HB02: INCIDENCE AND OUTCOMES OF SURGICALLY TREATED HEPATIC MALIGNANCIES IN FINLAND

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AIMS
To analyze incidence, treatment, and outcomes of pediatric liver malignancies in Finland.

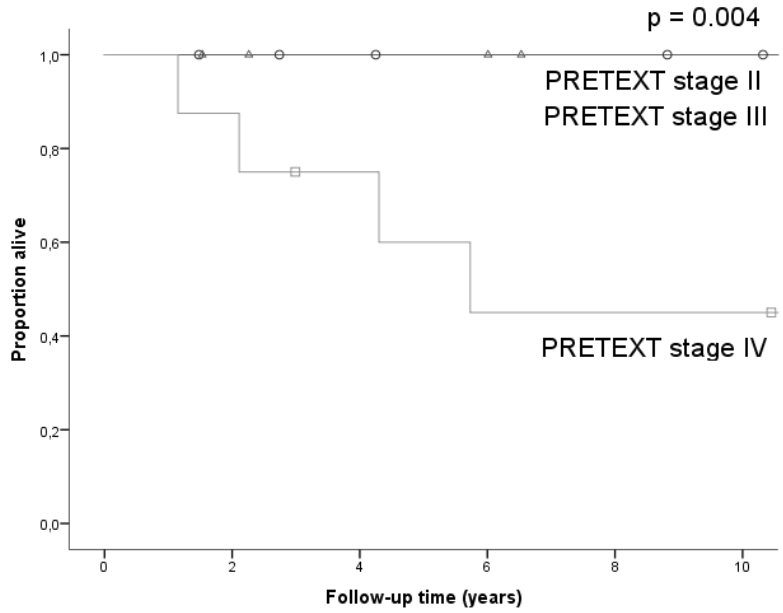
METHODS

Medical records, national cancer registry data, and follow-up characteristics of all children diagnosed with liver malignancies during 1987-2017 (n=47) were collected. Survival rates were calculated with the Kaplan-Meier method.

MAIN RESULTS

During follow-up, liver malignancy incidence remained stable at $1.1{:}10^{6}$. Altogether 42 patients with hepatoblastoma (n=24), hepatocellular carcinoma (HCC, n=11), and undifferentiated embryonal sarcoma (UES, n=7) underwent surgery at median age of 4.6 (interquartile range 2.0-9.6) years and were followed up for 13 (7.0-19) years. Cumulative three- and five-year survival was 91% and 86% for hepatoblastoma while 61% and 41% for HCC. 5-year survival was decreased for hepatoblastoma patients aged ≥2.4 years (73% vs. 100%, p=0.040), with PRETEXT IV vs. II-III (60% vs. 100%, Figure), and with recurrent disease (67% vs. 88%, p=0.029). None of the HCC patients fulfilled the Milan criteria and one third (n=4) presented with extrahepatic disease. Recurrent/residual HCC associated with decreased 5-year survival (0% vs. 83%, p=0.028). One UES patient developed recurrence after liver resection. Postoperative complications were more frequent (60% vs. 9%, p=0.030), time from diagnosis to surgery longer (6.8 vs. 3.9 months, p<0.001), while survival similar among transplanted (n=20) than resected (n=22) patients. At last follow-up, growth was disturbed in three patients (7%). Deaths occurred for recurrent malignancy (n=8), adverse effects of chemotherapy (n=5), or unrelated reasons (n=1).

CONCLUSIONS Apart from PRETEXT IV hepatoblastoma and extrahepatic HCC, outcomes for pediatric liver malignancies were excellent. Chemotherapy-related complications significantly contributed to mortality.



HB03: IMPACT OF PERI0PERATIVE COMPLICATIONS AFTER PARTIAL HEPATECTOMY ON OVERALL SURVIVAL OF PATIENTS WITH HEPATOBLASTOMA

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AIM OF THE STUDY
Surgery is one of the cornerstones in the treatment of hepatoblastoma. The aim of this study was to assess perioperative complications after partial hepatectomy (PH) for hepatoblastoma and to evaluate their impact on 3 years overall survival (3y OS).

METHODS
All patients that had a PH for hepatoblastoma after chemotherapy according the SIOPEL protocols in our institution, a pediatric liver disease and transplantation center, between 1996 and 2015 were included in this study and were evaluated regarding intraoperative and postoperative complications according to Clavien Dindo classification.

MAIN RESULTS
116 patients underwent a PH for hepatoblastoma, 69 standard-risk hepatoblastoma and 47 high-risk hepatoblastoma. Sixteen intraoperative complications occurred in 13 patients (11,2%) including 11 severe hemorrhages, 2 tumoral rupture, 2 air embolisms. One patient died due to a severe hemorrhage and air embolism. Patients with a vascular involvement of the portal vein or of the inferior vena cava had significantly more intra operative complications (OR 11,7 $IC_{95\%}$ (3,2-39), p<0,001). 3y OS was 92,2% $IC_{95\%}$ (85-96) in patients without intraoperative complications and 61,5% $IC_{95\%}$ (30,8-81,8) in patients with intraoperative complications (p=0,0004).
Postoperative complications occurred in 40 patients (34,5%), consisting in 28 complications grade 2 and 12 complications grade 3. There was no impact of postoperative complications on 3y OS.

CONCLUSIONS

Perioperative complications after PH are frequent. Intraoperative complications occurred more frequently in patients with a tumoral vascular involvement and are associated with worsened 3y OS. In our experience, postoperative complications have no impact on 3y OS.

HB04: INTRAOPERATIVE ULTRASOUND IN CONGENITAL HYPERINSULINISM: A PROSPECTIVE, BLINDED, SINGLE-CENTRE CHARACTERIZATION AND IMPACT STUDY

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AIM OF THE STUDY

To describe the intraoperative ultrasound (IOUS) characteristics of the pancreas and its surrounding structures in infants with congenital hyperinsulinism (CHI) and to evaluate the potential clinical impact of IOUS during surgical treatment.

METHODS

Prospective descriptive study on consecutive CHI patients operated at one centre between January 2017 and January 2019. IOUS was performed blinded to preoperative genetics and ^{18}F-DOPA-PET/CT, followed by unblinded continuous IOUS during pancreatic resection. The IOUS characterization and clinical impact were based on predefined criteria, and the final diagnosis was based on histopathology. Approved by the Danish health authority: reference no. 3-3013-2382/1.

MAIN RESULTS

Eight focal, three diffuse, and two atypical CHI patients were included. At IOUS, focal lesions presented as predominantly hypo-echoic, oval lesions with demarcated or blurred margins. The diffuse cases featured stranding and non-shadowing hyper-echoic foci. One was misclassified as focal because of hypo-echoic lesions. One atypical CHI patient also showed stranding and non-shadowing hyper-echoic foci, whereas the other did not. Both had inhomogeneous echogenicity. Peri-pancreatic lymph nodes were numerous and enlarged. IOUS had a clinical impact on the surgical approach in 12 out of 13 cases (91%).

CONCLUSIONS

IOUS characteristics of focal CHI lesions were uniform. Diffuse and atypical CHI showed different ultrasonographic patterns. IOUS was able to differentiate between focal and non-focal disease in all but one patient, and IOUS had a clinical impact on the surgical approach in 92% (12/13) of the patients in terms of localisation and ensuring safe and complete resection.

HB05: EARLY PREDICTORS OF OUTCOME OF KASAI PORTOENTEROSTOMY FOR BILIARY ATRESIA

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AIM OF THE STUDY
To determine reliable and early predictors of outcome of biliary atresia (BA) after Kasai's portoenterostomy (KP) in a large cohort of Italian patients.

METHODS
All consecutive patients with BA managed at our tertiary level Institution from 2010 to 2018 were retrospectively reviewed. Aspartate-aminotransferase-to-platelet ratio (APR) index at admission and TB7/0 index (total bilirubin (TB) on post-operative day 7th, divided by TB at admission) were measured. Clinical outcomes assessed were clearance of jaundice (CJ) within 6 months from KP (TB<1.5mg/dl), survival with native liver (SNL) and survival rate. Statistical analysis: Kaplan-Meyer curve, Log-rank test.

MAIN RESULTS
54 patients were enrolled (caseload 6 pts/year), of whom 50 underwent KP, at a median age of 66 days (range 24-127). Six patients presented CMV-IgM associated BA (11.1%), 6 (11.1%) cystic BA, 1 (1.9%) syndromic BA and 42 (77.8%) isolated BA. Cystic BA patients were statistically significantly younger than other patients (61 vs 69 days, P<0.05). Overall CJ rate was 60%. Predictive factors of achievement of CJ were cystic BA (P<0.05), APRindex<0.85 (P<0.05), age at Kasai<90 days (P<0.01) and TB7/0<0.80 (P<0.05). SNL was 82% at 1 year, 68% at 5 years and 66% at 8 years, respectively. One mortality (2%) was recorded. Predictive factors of SNL were cystic BA (P<0.05), APRindex<0.85 (P<0.05), TB7/0<0.80 (P<0.05). Cystic BA patients presented 100% of CJ and 100% NLS after 2 years from KP.

CONCLUSIONS
Cystic BA, APRindex and TB7/0 are reliable early predictors of good bile drainage after KP.

HB06: LAPAROSCOPIC PANCREATECTOMY FOR CONGENITAL HYPERINSULINISIM: A TERTIARY, SINGLE-CENTRE EXPERIENCE AND UPDATE

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AIM
Congenital hyperinsulinism (CHI) is a rare but serious condition. Surgery for CHI is considered following failure of medical management. We provide an update on the use of laparoscopic surgery for CHI in our specialist-centre.

METHODS
A retrospective casenote review of children undergoing pancreatic surgery for CHI January 2013 - January 2019. Data collected includes: patient demographics, focal/diffuse disease, operative details and outcomes.

RESULTS
Twenty patients underwent 22 surgeries for CHI with a median follow-up for 13 patients of 22.5months (range= 4-66months). Two patients underwent laparotomies for focal pancreatic head lesions and are not included in this study. The remaining 18 patients (male=12,focal lesion=13) underwent 20 surgeries (partial pancreatectomy=13, subtotal pancreatectomy=5, pancreatic head/neck excision with Roux-en-Y anastomosis= 2) at a median age of 6.6 months (range= 2-36months) and a median weight of 9kg (range=5.3-13.1kg). Two patients required a redo-laparoscopic excision of residual disease at a median time of 27days post initial surgery. 18/20 (90%) of operations were performed laparoscopically with 2/20 (10%) requiring conversion to open due to 1) intolerance to laparoscopy, and 2) to allow further examination and excision of the pancreatic head with Roux-en-Y jejuno-pancreatic anastomosis. Complications occurred in 2/20 (10%). One patient developed a peri-hepatic collection, managed with intravenous antibiotics. One patient developed a pancreatic leak managed by ultrasound-guided drainage. Median time to discharge was 22.5days (range=8-93 days).

CONCLUSIONS
Laparoscopic surgery for CHI in children is safe and feasible, and should be offered as an alternative to the established open technique.

HB07: EXPRESSION OF PROTEIN SOX9 IN BILIARY ATRESIA (BA)

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INTRODUCTION AND OBJECTIVE

BA is still an enigmatic disease of the infant.SOX9 is a member of the SOX family transcription factors and regulates bile duct development playing a role in liver regeneration and fibrosis; therefore it could be determinant in characterizing BA liver.

Aim: to study SOX9 expression in liver biopsies of BA patients.

MATERIALS AND METHODS

A case-control study (1:2) was carried out comparing liver biopsies from BA patients (performed during the Kasai procedure) (1998-2018), with liver specimens of age-matched infants that did not have BA.

A semi quantitative immunohistochemical study was carried out to evaluate the expression of Sox9 in the samples: presence (0-2), extension (0-3), intensity (0-2), lobular (0-1). The scores were added to create a semi quantitative scale from 0 to 11. The histological analysis was blindly performed by two independent observers. The results of both groups were compared.

RESULTS

The case was 24 ans controls 36. All BA cases had a score >3 (mean 7.75, range 4-11), while all controls scored <3 (average 0.89, range 0-3) ($p<0.0001$). A cut-off of 4 had 100% sensitivity and 100% specificity to differentiate BA from non-BA cases (area under Roc curve: 1.0, 95% CI: 1.0 to 1.0).

CONCLUSIONS

In BA livers SOX9 is strongly expressed in reactive ductular epithelium and moderately expressed in hepatocytes near fibrotic areas. This pattern is significantly different may have a role in the diagnosis and prognosis of BA.

KEYWORDS
Biliary Atresia, SOX-9, Liver Biopsy, Immunohistochemistry

HB08: DIFFUSE INFANTILE HEPATIC HEMANGIOMA: A 32 YEAR SINGLE CENTRE EXPERIENCE

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AIM OF THE STUDY

Infantile hepatic hemangiomas (IHH) are the commonest paediatirc liver tumours . The least common diffuse variant[1] – defined as near total replacement of the hepatic parenchyma - is the most life-threatening and associated with; high output cardiac failure; hypothyroidism; and consumptive coagulopathy. We report our experience of hepatic artery ligation (HAL) as a means to control life-threatening symptoms.

METHODS

Single-centre retrospective clinical and radiological review of n=125 IHH in period 1986-2018. Data quoted as median [range].

MAIN RESULTS

N=8 (6%) cases (6 female) had diffuse IHH. Infants presented at a median 53[17-225] days all with palpable hepatomegaly; cardiac failure (n=7), hypothyroidism (n=3) and consumptive coagulopathy (n=1). Median peak systolic hepatic artery (HA) diameter at presentation was 3.7[2.9-4.4] mm and median aortic ratio (degree of tapering - diameter above:below coeliac trunk) was 1.5 [1.2-1.75].
Medical management comprised; prednisolone n=5, vincristine n=2 and propranolol (2mg/kg/day) n=3. Failure of medical management prompted hepatic artery ligation (HAL) (n=5) at 88 [23-170] days of life and 35 [3-140] days following presentation. All infants with hypothyroidism required HAL.
At follow-up of 10 [0.08-14.3] years there was complete clinical and radiological resolution (n=2), clinical resolution but persisting radiological features (n=6)

CONCLUSION

Diffuse IHH is a life-threatening condition with most requiring HAL for survival despite newer agents such as propranolol. Radiological changes persist beyond clinical resolution necessitating long-term surveillance.

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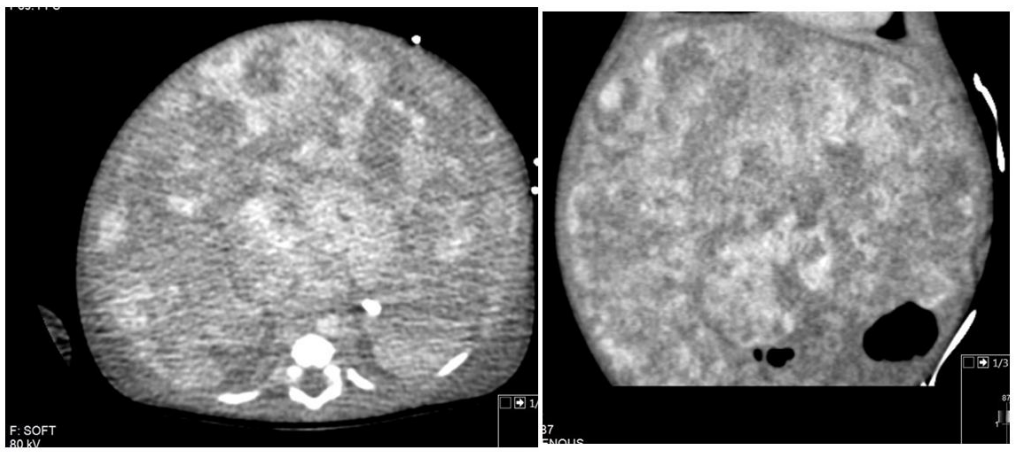
Fig 1: Diffuse IHH in 17-day old infant with near-total obliteration of the abdominal cavity



HB09: "BRIDGE" PROCEDURES IN CHILDREN WITH BILIARY ATRESIA AFTER KASAI PORTOENTEROSTOMY

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AIM

To analyze the effect of «bridge» procedures in children with biliary atresia after Kasai portoenterostomy (KPE).

METHODS

224 patients with BA have been treated at Russian Children's Clinical Hospital. Five-year survival with native liver was 67%. Some patients required repeated operations. Formation of secondary biliary cysts was observed in 16 patients. Other 9 children developed severe portal hypertension with oesophageal bleeding although with compensated liver function. In all cases either CT imaging or MRI-cholangiography was done. Before biliary reconstruction, percutaneous transhepatic drainage of the most dilated cyst/bile duct was performed. External drainage lasted about two weeks and helped to sanitize bile ducts and relieve jaundice. The position of the cyst in relation to portoenteroanastomosis was clarified intraoperatively using ultrasound-navigation. The new bilidigestive anastomosis was created using proximal part of previously anastomosed intestinal loop. All patients had compencated liver function and were consulted by transplantologists.

RESULTS

Sixteen children underwent biliary reconstructions. Nine patients had splenorenal shunting. In two cases both procedures were performed. Three patients who underwent biliary reconstructions died due to recurrent cholangiogenic sepsis and/or acute decompensation of chronic liver disease. One patient, after two «bridge» operations required a liver transplant.

Survival rate with native liver increased in all patients after «bridge» procedures: 3-year (n=7), 5-year (n=12), 10-year (n=3).

No lethal outcomes and complications after splenorenal shunting.

CONCLUSION
Indications for «bridge» procedures are established individually. These operations help to significantly increase survival with the native liver. This approach can be a good alternative for early liver transplantation.

HB10: IMMUNE STATUS OF CHILDREN WITH EXTRAHEPATIC PORTAL HYPERTENSION AFTER DIFFERENT TYPES OF PORTOSYSTEMIC BYPASS OPERATIONS

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AIM

The paper is focused on the features and grade of changes in the immune system of children under the extrahepatic portal hypertension (EPH) after splenorenal and mesocaval shunting operations.

METHODS

The study included 100 children with EPH who were divided into two groups depending on type of portosystemic bypass operation, in whom the cell, humoral and unspecific parameters of immune system were evaluated in three and six months after surgical intervention. The leading pathological factors were defined.

MAIN RESULTS

It was established that there is significant increase in rates of IgM, Ig A and phagocytosis ($p<0,05$), secondary cell immune deficiency with decreasing of absolute number of lymphocytes to $(1.18 \pm 0.6)\ 10^9/l$ and their subpopulations (CD3+, CD4+, CD8+) ($p<0,001$) comparing to normal age values. The values of spontaneous NST-test before the surgery were elevated ($55.05\% \pm 5.03$), with the normal value at 10%. The evaluation of immunograms in the dynamics after two types of operations showed the following positive changes: increasing of absolute and relative number of T-lymphocytes, normalization of the level of immunoregulatory index. However the high rates of IgM, IgA and increased activity of the NST test were persistent. Other parameters of immunogram were not significantly different from the normal age value.

CONCLUSIONS

Portosystemic shunting operations improve the parameters of imunograms in patients with EPH, however in the regard of the persistence of pathological changes the pharmocological therapy after bypass surgery can be proposed. Thus the further basic studies to investigate the pathogenesis of these changes should be performed.

HB11: CARDIAC ANOMALIES ASSOCIATED BILIARY ATRESIA: DEFINING CHARACTERISTICS

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INTRODUCTION
Biliary atresia (BA) is known to be associated with congenital heart disease (CHD) though its demographic characteristics have yet to be determined. We aimed to describe the range of concurrent CHD while providing a functional framework of risk.

METHODS

Demographic and clinical variables collected from an analysis of a prospectively-maintained single centre database (Jan 1998 – Dec 2018) and grouped according to cardiac diagnosis (A = acyanotic e.g. coarctation of the aorta; B = cyanotic, e.g. Fallot's tetralogy and C = insignificant, e.g. patent foramen oval). Date-matched BA infants were used as controls (2 for 1). Data are presented as median. Non-parametric analysis was used. A P value of < 0.05 was regarded as significant.

RESULTS

Of 524 BA cases treated during the study period 39(7.4%) [n = 25, (64%)female] infants had an accompanying structural cardiac anomaly. This was classified as (A: 24 (61.5%), B: 8 (20.5%) & C: 7 (18%). Multiple anomalies were typically present including: BASM (n=21,54%); duodenal atresia (n=4); Cat-Eye syndrome (n=3), other chromosomal anomalies (n=1); and exomphalos; urogenital sinus; anorectal atresia; oesophageal atresia (all n=1). No pattern of cardiac anomalies and other anomalies was observed.

Feature	Card BA	Cont BA	P value
BASM	21	6	0.0001
Antenatal	8	3	0.005
IVF	2	0	n/a
Age at Kasai	56	52	N.S.
Bilirubin(umol/L)	172	141	0.007
AST(IU/L)	190	179	N.S.
APRi	0.72	0.63	N.S

CONCLUSION
Cardiac-associated biliary atresia occurs in about 7% of a European series with 82% significant. Most are within the BASM domain with 20% presenting antenatally. Time to biliary surgery appears unaffected but they have a higher degree of jaundice at that point.

HB12: MESENCHYMAL HAMARTOMA OF LIVER: OUTCOMES OF SURGICAL MANAGEMENT

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AIM
To evaluate the presentation, diagnosis, and outcome of surgical management of mesenchymal hamartoma (MH) over 13 years.

METHODS
Retrospective analysis of children with a diagnosis of MH managed at our centre from January 2007 to January 2019.

RESULTS
Thirteen patients with a diagnosis of mesenchymal hamartoma of liver were included in the study. There were 7 (54%)males and 6 (46%)females. Mean age was 22.8 months(range 15 days to 96 months). While one (8%) was antenatally diagnosed, two (15%) were diagnosed incidentally, remaining 10 (77%) were diagnosed on investigations for abdominal distention. Ultrasonography and computed tomography was suggestive of a multiloculated, multiseptated thick walled solid lesion with cystic component in all children. Three (23%) had preoperative severe respiratory distress and underwent preoperative ultrasound guided drainage of the largest cystic space. Right lobe was involved in 92% children. All underwent surgical resection: Non-anatomical in 5 (39%) and anatomical resection in 8 (61%; right hepatectomy in 6 and extended right hepatectomy in 2). Post operative complications were observed in 2(15%;bile leak and bleeding in one each). Two children had gross residual lesion after non anatomical resection and one of them had a recurrence 1 year after surgery. Histopathology was confirmatory of mesenchymal hamartoma in all patients with feature of chronic cholecystitis in 23%.

CONCLUSIONS

Most children with MH present with abdominal distention and liver resection was curative in majority of patients, with recurrence noted only in one (7.6%). The long term outcome is good, with 100% survival.

PW9TR01: PEDIATRIC POLYTRAUMA DEFINED USING NEW INJURY SEVERITY SCORE AND SEVERE TRAUMA PREDICTING FACTORS

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AIM
New Injury Severity Score (NISS) is an anatomical injury scoring system which has been used to evaluate adult trauma. This study proposes to define pediatric polytrauma threshold for NISS and to find possible severe trauma predicting factors.

METHODS
A retrospective study included 359 acute trauma patients up to 18-years-old with multiple injuries who received CT scan at emergency department from January 2013 till December 2017. ROC-curves were generated using possible outcomes: length of stay (LOS) >7days, Intensive-Care-Unit (ICU) admission and need for operation (OP). Data was analyzed with SPSS (Mann-Whitney-test, Chi-square-test), significance defined as $p<0.05$. Study has received ethical approval.

RESULTS
NISS>7 was threshold for longer LOS, AUC=0.911(95%CI 0.879-0.942, $p<0.0001$) with sensitivity-78%, specificity-88%, and it is related to positive CT scan $\chi^2(1, n=359)=177.97$, $p=0.0001$, $\varphi_c=0.704$, with true positive rate of 90%. Threshold for ICU admission was NISS>9, AUC=0.828(95%CI 0.756-0.901, $p<0.0001$), sensitivity-71%, specificity-82%. OP threshold was NISS>13.5, AUC=0.917(95%CI 0.877-0.956, $p<0.0001$), sensitivity-78%, specificity-91%. All patients were divided into two groups: NISS<14 and NISS≥14. Mean NISS scores were 3.93(95%CI 3.55-4.31) and 18.71(95%CI 17.13-20.29, $p<0.0001$). In both groups mean age was 11 years($p=0.944$) and gender did not differ($p=0.482$). The relation between polytrauma and injury pattern (motor-vehicle-associated) was significant $\chi^2(5, n=353)=21.94$, $p=0.001$, $\varphi_c=0.249$.

CONCLUSIONS
NISS≥14 can be used to define pediatric polytrauma and score above 7 indicates serious trauma with high possibility of positive CT scan. Possible polytrauma indicators include injury pattern like motor-vehicle-related injuries but age and gender are not indicating factors for polytrauma.

PW9TR02: HYPOTENSION REVISITED. OUR DEFINITION OF SHOCK IS UNDER-PRESSURIZED

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AIMS

Cutoffs for hypotension in children based on outcome studies are lacking. PALS and ATLS definitions are based on normal populations. The goal of this study was to compare different normal population based cutoffs including 5th percentile of systolic blood pressure (P5-SBP) in children and adolescents from the German Survey on Children and Adolescents (KiGGS), US population data (Fourth-Report) and cutoffs from PALS and ATLS guidelines.

METHODS

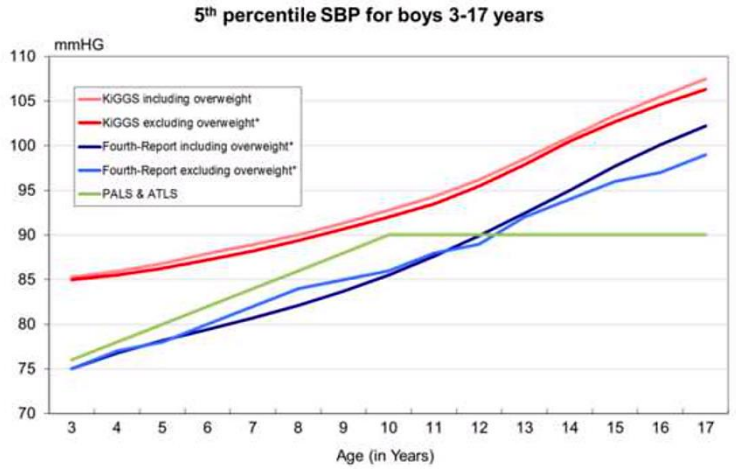
P5-SBP according to age, sex and height was modelled based on standardized resting oscillometric BP measurements (12199 children aged 3-17 years) from KiGGS 2003–2006. Additionally, we applied the age-adjusted pediatric shock index in the KiGGS study.

RESULTS

Current P5-SBP data were on average 7 mm Hg higher than Fourth-Report-P5-SBP. For children aged 3-9 years KIGGS P5-SBP follows the formula 82 mm Hg + age, for age 10-17 the increase was not linear. PALS/ATLS thresholds were between KiGGS and Fourth-Report until age 11. The pediatric shock index, which is supposed to identify severely injured children, was exceeded by 2.3% non-acutely ill KiGGS participants.

CONCLUSIONS

5th percentile-cutoffs of the current population were higher than in previous databases. The PALS/ATLS 90 mm Hg cutoff for adolescents targets only those in the <1% of the low SBP range and represents an under-triage compared to P5 at younger ages according to both KiGGS and Fourth Report. Pediatric shock index cutoffs when applied to a healthy cohort lead to a relevant percentage of false positives. Current results from healthy children should be verified in pediatric trauma cohorts.



PW9TR03: EFFICACY OF SOFT TISSUE SURGERY FOR THE LOWER EXTREMITIES FLEXION DEFORMITIES IN CHILDREN WITH CEREBRAL PALSY

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AIM OF THE STUDY

To assess the results of concomitant hamstring lengthening and plication of the patellar tendon.

METHODS

Retrospective data of 38 patients (72 knees), 27 boys (71%) and 11 girls (29%), with flexion knee contractures due to cerebral palsy who were treated from 2012 to 2018 were reviewed. Average patient age was 9.8 (SD=2) years (range, 7 - 12 years). The degree of knee contracture, ambulatory status (using the Gillette Functional Assessment Questionnaire (Gillette FAQ) 10-point scale) were evaluated before surgery and after rehabilitation period. The follow-up period ranged from 6 months to 6 years. Statistics were given as mean (SD = standart deviation). A paired t test was used to detect differences between the preoperative and postoperative data. Statistical significance was determined as a p-value < 0,05.

MAIN RESULTS

Preoperative knee flexion deficiency ranged from 10 to 90°. Mean preoperative flexion contracture was 26.6° (SD= 18.9). After surgery knee flexion contracture (6.9° , SD= 10.4) has significantly decreased (p<0,05). Mean correction amount of flexion contracture was 77.7% (SD= 22.3%). Mean preoperative score of Gillette FAQ scale was 2 (SD= 1). After surgery mean Gillette FAQ score (3 , SD= 1) has significantly improved (p<0,05). Three patients had the following complications: synovitis of both knee joints after immobilization period and extensor contractures of the knee joints with 20° and 60° knee extension deficiency at examination after one year since surgery.

CONCLUSIONS

The obtained data indicate a rather high efficacy of surgical treatment both in terms of goniometric and functional indicators. However, it is necessary to consider possible complications associated with requirement for long-term postsurgery immobilization.

PW9TR04: COMPRESSION THERAPY OF POSTOPERATIVE SCARS

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AIM
Evaluation of the effectiveness of compression therapy with a patch of prolonged action of Contractubex in the formation of skin scars in childhood after surgery.

METHODS
In a prospective open-label randomized trial, 109 patients aged 5.3±2.1 years after surgery (73 boys and 36 girls). Patients were divided into 2 groups: in the main group (54 children) was performed prolonged patch Contractubex, in the control group (55 patients) — dynamic observation. The scar deformation was assessed according to the Vancouver scale for 10th, 30th and 90th postoperative days.

RESULTS
94.4% of patients had good compliance; in 2(3.7%) - satisfactory; in 1(1.9%) - unsatisfactory compliance. In our study, the formation of hypertrophic scars in the main group was significantly less frequent than in the control group (1 and 8 patients, respectively, x^2 =4,241 with the 1st degree of freedom; p=0,042).

CONCLUSIONS
Thus, the use of a prolonged plaster Contractubex in the near and distant period a good cosmetic and functional result in the formation of a postoperative scar was provided.

PW9TR05: PREVALENCE AND DISTRIBUTION OF OCCULT FRACTURES IN CHILDREN WITH (SUSPECTED) NON-ACCIDENTAL TRAUMA

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AIM

Skeletal surveys are indicated for young children (< 5 years) when non-accidental trauma is suspected. According to a set protocol, radiographs of the entire skeleton are taken to detect occult fractures. Knowledge of the distribution of occult fractures is relevant for clinicians in order to improve detection of these fractures and awareness of symptoms.

METHODS

Between 2007 – 2017 all skeletal surveys of all children (< 5 years) were retrospectively analyzed. Both radiographs of admitted children and reassessment images from all over the country were included and reviewed by a forensic paediatric radiologist. Deceased children were excluded. Variables as gender, age (weeks), initial indication and occult fractures were collected. If there was a second skeletal survey (as follow-up), these occult fractures were collected.

RESULTS

In total 364 skeletal surveys of 293 children were included. Median age was 23 weeks (IQR 11 – 48), there were 171 (58,4%) boys. A total of 196 occult fractures were detected in 112 (38,2%) children. Occult fractures were detected in 36/119 (30,3%) children with a fracture as presenting symptom, 24/88 (27,3%) children with head trauma and 22/45 (48,9%) children with hematoma. Rib (n=55, 28,1%) and lower leg (n=37, 18,9%) fractures were most detected.

CONCLUSION

Occult fractures on skeletal surveys were detected in 38% of the children. Occult fractures were most prevalent if the initial indication for skeletal survey was a (suspected) fracture or head trauma. Clinicians should be aware of occult fractures in young children with suspected non-accidental injury.

PW9TR06: THE ROLE OF ULTRASOUND IMAGING OF CALLUS FORMATION IN THE TREATMENT OF LONG BONE FRACTURES IN CHILDREN

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AIM OF THE STUDY
The aim of the study was to analyze the correlation of ultrasound with radiograms in imaging of callus formation after fractures and to analyze the correlation of vascular resistance index (RI) and the degree of vascularization of the callus with a subjective radiological assessment of the bone union quality.

METHODS
The prospective study was conducted on a group of 51 children aged 2-16 years treated for long bones fractures. During ultrasound measurements of the callus were performed. Using the Power Doppler callus vascularity was visualized and vascular resistance index (RI) was measured .The same measurements were made within the corresponding area of the healthy limb. The results obtained by ultrasound were compared with radiograph measurements and with the subjective assessment of the callus quality.

MAIN RESULTS
The study confirmed high effectiveness of ultrasound examination in imaging of callus formation. Statistical analysis of the measurements of length and width of callus has demonstrated that the differences between results obtained in the ultrasound in comparison with X-rays were not statistically significant. A subjective, semi-quantitative method of evaluating vascularization of callus, based on the measurement of RI and the number of blood vessels correlates with the radiological assessment of the degree of callus calcification and gives important information on the quality of bone union.

CONCLUSIONS
Results of the study indicate the high efficacy of ultrasound in the evaluation of callus formation after fractures of long bones in children and the possibility of its alternative use to X-ray examination.

PW9TR07: QUANTIFYING THE IMPACT OF SOUTH AFRICAN TOWNSHIP ENVIRONMENTS ON PAEDIATRIC TRAUMA

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AIM OF THE STUDY
Paediatric trauma-related admissions are a daily occurrence at our tertiary level hospital in South Africa. Yet, there are no official statistics, and a dearth information regarding this patient population. Our study objectives were to quantify the demographics, spectrum of injuries, and outcomes for paediatric trauma admissions.

METHODS
After obtaining Ethics approval from the University Medical Research Committee, a 5-year retrospective review of patient files from September 2013 to August 2018 was undertaken, including all patients admitted with a diagnosis related to trauma.

MAIN RESULTS
5326 children were included in the study:49% sustained burn injuries, with mean age of 2.5 years, mean TBSA of 14.3% and mortality rate of 5.7%. Scald burns accounted for 77% of injuries, followed by 9% due to flame burns (mostly from informal dwellings caught alight), and 7% electrical burn injuries (89% from illegal electrical connections and wiring). Non-burn related injuries were mainly due to road traffic accidents (53.3%), falls (24.3%), non-accidental injuries (5.4%), and structural objects such as doors and security gates falling on children (4.7%). Injuries further stratified into age-groups. Mortality rate was 2% but 6-fold higher with an associated head injury. Violent trauma including gunshot wounds, stabs, assault and animal bites accounted for 10% of injuries but carried a mortality of 4%.

CONCLUSIONS
Many injuries can be attributed to unsafe living environments, poverty, lack of education and insufficient supervision. This information is relevant for designing primary prevention programs, social interventions and to highlight the perils faced by these vulnerable children.

PW9TR08: EVOLUTION OF THE TERTIARY SURVEY FOR PAEDIATRIC TRAUMA PATIENTS AT A MAJOR TRAUMA CENTRE

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BACKGROUND

The tertiary trauma survey, to evaluate and catalogue all injuries after resuscitation and initial intervention, has been shown to minimise missed injuries. Completion of a tertiary survey is a major trauma quality indicator. We describe the value in clinical audit to assess and improve tertiary survey completion in paediatric trauma patients at a major trauma centre.

METHOD

Prospective clinical audit undertaken 6 months after implementation of a tertiary survey proforma in 2014 and repeated in 2018. Tertiary survey completion and documentation compliance was measured against the local trauma network audit standard. Statistical comparison used Fisher's Exact Test.

RESULTS

Audit data in 2014 showed the tertiary survey proforma was present in 7/13 (54%) of patient records, with complete clinical details in only 5/13 (38%). Repeat audit in 2018, demonstrated significantly improved documentation with 22/24 (92%) proformas present in the patient records (p=0.0134) and 20/24 (83%) with complete clinical details (p=0.0097) (Table 1). Despite complete clinical details in 20/22 proformas, only 15 (68%) were signed and 9 (41%) dated. There has been no known missed injury since the introduction of tertiary survey proforma.

CONCLUSION

Evolution of the paediatric trauma service has resulted in significant improvement in the tertiary survey completion and documentation. Regular audit demonstrates progress and highlights issues to be addressed. Simple interventions, such as a proforma, can be effective, however behaviour change takes time. Future development will include an electronic proforma to allow automatic time and date stamp and electronic signature, and to minimise incomplete data entry.

PW9TR09: ROLE AND IMPLEMENTATION OF THE AAST GUIDLINES FOR TRAUMA SURGERY IN PEDIATRIC SOLID ORGAN INJURIES; ARE THEY STILL EVIDENCE BASED?

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INTRODUCTION

The AAST guidelines for solid organ injuries introduced in 2000 changed the initial treatment decision shifting from surgical to conservative approach. However, diversity exists regarding the guidelines for hospitalization in ICU, ward, and activity restrictions.

PURPOSE

This report examines the impact of these guidelines for post-therapy decision in 3 different European countries with different health care level.

METHOD

Between 2014-2018 data of children with liver or/and spleen injury were collected. The CT-examination determined the classification. The duration in the ICU, ward stay and abstention from activities were evaluated.

RESULTS

All centers contributed with data of 64 patients. The table show 50 which followed the guidelines for each parameter separately. However, in only 2 cases (4%) the guidelines were completely adopted. Laboratory examinations at admission and discharge that might have influenced the decision making for the treatment procedure, where also evaluated.

CONCLUSION

The majority of liver and spleen injuries in children should and are achievable treated non-operatively. The AAST guidelines contributed significantly and were instrumental in achieving this task. The study however demonstrates a significant unconformity even in countries with high standard medical care. These 18-year-old guidelines are not employed fully after the initial decision not to operate. This study seems to give sufficient evidence to promote conformity of care with significant reduction of resource utilization without adverse sequela for these children.

Centre/N	ICU	Ward	Activity
A/14	4(28%)	0	0
B/14	7(50%)	0	1(7%)
C/14	13(59%)	4(18%)	4(18%)
mean	48%	8%	10%

PW9TR10: INCIDENCE OF OCCULT FRACTURES IN CHILDREN TREATED FOR ACUTE ANKLE SPRAIN

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AIM

To assess and report the incidence of occult distal tibial or fibular fractures in children treated for acute ankle sprain, with evaluation for presence of periosteal new bone formation on plain radiographs.

METHODS

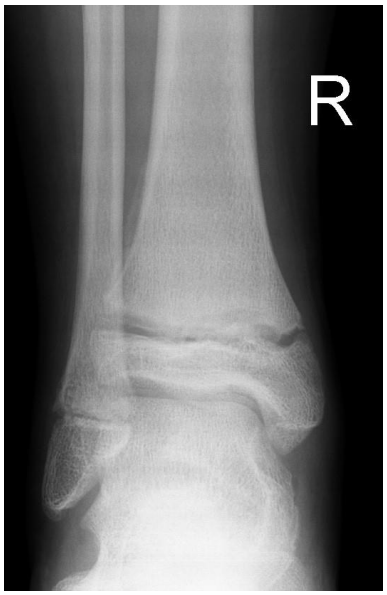
We undertook a retrospective analysis of files of 193 children treated for ankle sprain, over a 2 year period, between 2016 and 2018, with a review of radiographic findings. All radiographs were reassessed for a new periosteal bone formation by two radiologists in consensus. Files include clinical assessment and radiography in AP and lateral views. All patients were treated with plaster cast and home rest. A subsequent visit includes plaster cast removal and reassessment. The inclusion criteria were: an acute ankle sprain, pain on palpation around the ankle, open physes at level of ankle and initial radiographic finding negative for fractures. Exclusion criteria were: findings of a fracture around the ankle at initial x-ray, patients without a follow up radiography.

RESULTS

Out of 193 cases, 28 patients met the inclusion criteria. Age of patients was 2-14, mean 11. Sixteen were boys and 12 girls. Evidence of periosteal new bone formation was found in 4 (14%) of the 28 patients. There were no signs of fracture displacement on follow up radiographs.

CONCLUSION

The presence of periosteal new bone formation, represents an indirect signs of occult fracture of distal tibia or fibula in children with ankle sprains. Not all ankle injuries are sprains, and the awareness when dealing with pediatric patients with ankle sprains should be increased.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PW9TR11: TREATMENT OF FINGERTIP AMPUTATIONS IN CHILDREN WITH A SEMIPERMEABLE DRESSING: REVIEW OF 19 CASES

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Traumatic fingertipinjuries are a common presentation in pediatrics emergency settings. The coverage with semipermeable dressings (Tegaderm®) is an efficient and cheap method that allows granulation and epithelization.

METHODS

We retrospectively reviewed pediatric patients (<16 years) with fingertip amputation grades 1, 2 and 3 in Allen's classification treated with semipermeable dressing between January, 2017 and October, 2018. We analyzed demographics of the patients, type of injury, follow-up, outcomes and complications. A telephonic survey of satisfaction was realized to the patients.

RESULTS

85 patients with a wound in fingertip were treated in our emergency department. 19 children (with a mean of 4 [1-10] years) were included in the study. Three patients presented a fracture of the distal phalanx. Nine has bone exposition. Nail injury were reported in 5 patients. The dressing was removed after a mean of 22 (7-41) days and was changed a mean of 3 times. In average, 4 consultations were needed during 40 (10-90) days of follow-up. The cutaneous coverage and restoration of injury were obtained in all patients without surgical treatment. One patient needed hospitalization for pain control. Three patients presented hypergranulation, that was treated with chemical cauterization. No infections, nail dystrophy or alterations of the sensibility or function were reported.

CONCLUSIONS

The use of a semipermeable dressing is a not-surgical alternative in the treatment of the fingertip amputations grades 1, 2 and 3 in Allen's classification in pediatric patients. The most frequent complication is hypergranulation.

PW9TR12: ANALYSIS OF INFANT INJURIES; LESSONS FOR PREVENTION STRATEGIES

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AIMS OF THE STUDY

Infants are totally dependent on their caregivers; especially under the age of 6 months when they are not yet mobile. The exact mechanisms of infant injury has never been analysed in our country. The aim of this study was to describe mechanisms of trauma in children under the age of 12 months, stratified in the 4 quarters of the first year : 0-2 months, 3-5 months, 6-9 months and 10-12 months.

METHODS

This is a retrospective descriptive audit study of our trauma registry between January 2013 and December 2016. Only children less than 1 year of age were included. If abuse was suspected, the social work department was consulted to interrogate the circumstances around the occurrence of the injury. Mortuary data on traumatic infant deaths in the drainage area of the hospital were also included.

MAIN RESULTS

A total of 2279 cases of injured infants were identified. Leading causes of injury were falls (957; 42.0%) and burns (736; 32.3%). The observed patterns of injury changed according to the different age groups. In 55 of infant injury cases abuse was confirmed.

CONCLUSION

Burns and falls are a significant contributor to the burden of infant injuries in Cape Town. The significant burden of these injuries emphasizes the urgent need for targeted prevention strategies to improve safety. Findings do also suggest that abuse is not recognized in a sufficient way, more research to determinants that predict child abuse in a standardized way is necessary.

PW10UG01: INDICATIONS, SURGICAL COMPLICATIONS AND LONG-TERM OUTCOMES IN PEDIATRIC OESOPHAGEAL RECONSTRUCTIONS

Koivusalo Antti [1], Janne Suominen[2], Mikko Pakarinen[2]
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AIM OF THE STUDY

Oesophageal reconstruction is a major procedure with frequent postoperative problems. We assessed retrospectively the indications, surgical complications and long-term outcomes in pediatric oesophageal reconstructions from 1998 to 2018.

METHODS

With ethical consent**,** hospital records of 22 patients (10 males), median age at surgery 16(IQR 9.3 – 38) months with total of 24 reconstructions, were reviewed.

MAIN RESULTS

Main indications were oesophageal atresia (OA, n=17; first repair n=13, after complicated primary repair n=4),major loss of oesophageal length (n=4) and inflammatory pseudotumor (n=1). Main associated anomalies were cardiac (n=5), bronchopulmonary (n=1), laryngeal (n=1) and chromosomal (n=4). Reconstructions included pedicled jejunum interposition (PJI, n=15), reversed gastric tube (RGT, n=5), gastric pull-up (GPU, n=2) and free jejunal graft (FJG, n=2). Two PJIs were redo-operation safter failed first PJI. Complications are outlined in Table. After median follow-up of 5.6(IQR 1.9 – 12) years 21(96%) patients survived. Eighteen (86%) survivors have intact reconstruction. Recurrent, life-threatening reflux related pulmonary infections in three patients (PJ n=2, GT n=1) were controlled only by graft removal, cervical oesophagostomy and feeding ostomy after five, nine and 17 years. Fourteen patients have full oral feeding whereas seven, including three with removed graft, require ostomy feeding.

CONCLUSIONS

Main indication for reconstruction was oesophageal atresia. Nearly half. of patients had postoperative complications and one third remained with feeding ostomy. Recurrent pulmonary infections required graft removals. Overall mortality was low.

Table

	Leakage	Stricture	Major Reflux	Feeding ostomy	Graft removed	Dead
PJI (n=15)*	4	5	3	5	2	1
FJG (n=2)	1	1	0	0	0	0
GPU (n=2)	1	0	0	2	0	0
RGT (n=5)	2	5	4	1	1	0
	8 (33%)	11 (46%)	7 (29%)	8 (33%)	3 (13%)	1(4%)

PW10UG02: COMBINED MULTICHANNEL INTRALUMINAL IMPEDANCE AND pH MONITORING IN THE EVALUATION OF SYMPTOMATIC PEDIATRIC PATIENTS WITH REPAIRED ESOPHAGEAL ATRESIA

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AIM

The aim of this study was to assess the role of multichannel impedance-pH (MII-pH) monitoring in the evaluation of patients with repaired esophageal atresia (EA) who had esophageal and/or extra-esophageal symptoms.

METHODS

Thirteen patients with EA who underwent MII-pH monitoring for evaluation of gastroesophageal reflux (GER) were enrolled in the study. The MII-pH recordings were analyzed by software automatically.

RESULTS

The median age of subjects (Male: Female=8:3) at the time of MII-pH monitoring was 6.5 years (1.3-13.5). The most common extra-esophageal and esophageal complaints among patients were recurrent pulmonary infections (92%) and dysphagia (54%), respectively. Seven patients (54%) were on acid-suppressive therapy at the time of impedance testing. Videofluoroscopy (n=11) revealed aspiration in 4 patients (36%) and esophageal motility disorder in 8 patients (73%). The results of pH and impedance measurements are listed in Table 1. Nearly one-fourth of retrograde bolus movements (RGM) (n=136, 23%) were proximal reflux episodes reaching the uppermost recoding sensor. When normal values for adults were applied to our study group, patients having acidic, weakly acidic and non-acidic RBM above 95th percentile were 0%, 23% and 38%, respectively. Five of the 8 patients with normal pH monitoring results had pathological weakly acidic and/or non-acidic RBM in impedance analyses.

Table 1: The results of MII-pH monitoring in children with esophageal atresia.

MII-pH parameter	
Median of Reflux index (RI)	3.8% (0.1-35.4)
Patients with RI>5%.	38% (n=5)
Total and median number of reflux episodes (pH<4)	618 / 30 (3-233)
Number of reflux episodes longer than 5 minutes duration	n=46 (13%)
Retrograde bolus movements (RBM)	n= 565 (34% liquid, 66% mixed)
Reflux episodes (pH)	Acidic (pH<4), 30% Weakly acidic (4<pH<7), 47.5% Non-acidic (pH>7), 22.5%

PW10UG03: LONG-TERM OUTCOMES OF ESOPHAGEAL REPLACEMENT IN CHILDREN: EXPERIENCE FROM A TERTIARY CARE CENTER

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AIM

To study and compare the long-term outcomes of two different methods (gastric transposition and colonic interposition) of esophageal replacement (ER) in children.

METHODS

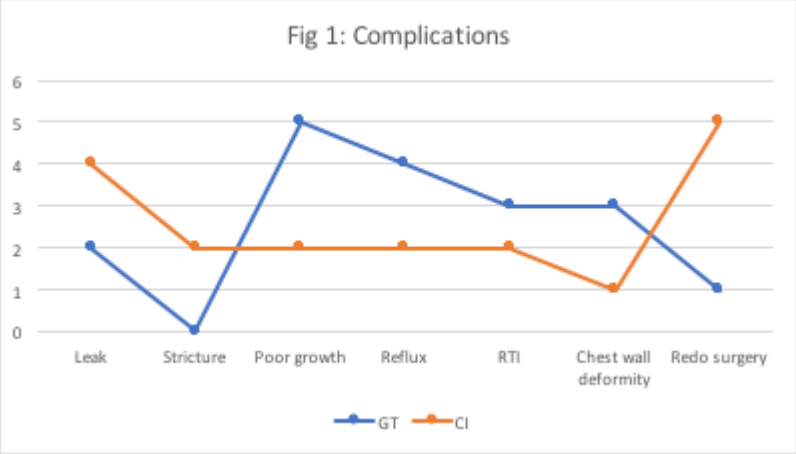
Single center retrospective study. Institution Ethical Committee approval taken. All children who had undergone ER from January 1997 to December 2017 and were on atleast 1 year follow up after ER were included in the study. All children were evaluated with respect to nutritional, developmental and functional outcomes by anthropometry and blood parameters including hemoglobin; serum ferritin, transferrin, B12 levels, total protein and albumin; oral contrast study, Hepatobiliary Scintigraphy (HIDA) study, Gastroesophageal reflux (GER) study, gastric emptying test (GET) and pulmonary function tests.

RESULTS

Twenty-two (M: F=15:7) children were included in the study. The mean age at surgery was 46.4 months (range 3 days to 175 months). The average follow-up post ER was 107.1±77.5 months (range 17- 234 months). Out of 22 children, fourteen (63.6%) belonged to congenital esophageal atresia group while seven (31.8%) belonged to corrosive esophageal injury group and one (7.6%) patient had acquired traumatic Tracheoesophageal fistula. Gastric transposition (GT) was done in twelve (54%) while colonic interposition (CI) was done in ten (46%) cases. There was no significant ($p>0.05$) difference in the nutritional, developmental and functional outcomes of both the methods of esophageal replacement in our cohort. Complications (Fig.1) including leak, stricture, reflux etc. were observed in our cohort.

CONCLUSIONS

Assessment of nutritional, developmental and functional parameters in children after ER reveals good long-term results. There was no significant difference in the method of ER.



PW10UG04: OUTCOMES OF LAPAROSCOPIC MANAGEMENT OF HIATUS HERNIA IN THE PEDIATRIC AGE GROUP

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AIM
Hiatal hernia (HH) consists of stomach herniation through the esophageal hiatus. This study reviewed outcomes on laparoscopic management of HH in children.

METHODS
MEDLINE/PubMed were reviewed. Studies in patients under 17 years of age and published in English were included, and selected by 2 independent reviewers. Data was collected for age, gender, comorbidities, type of HH, surgical technique, complications, conversions, recurrence and mortality.

RESULTS
Six papers with n=164 patients were included. Mean age were 6 years (range 8 months - 17 years) with male predominance (n=106, 64.6%). Neurological impairment was reported in n=8 cases, but the information was not available for the majority of cases (n=136; 82.9%). Type 1 HH was reported in 13 cases, type 2 in six, type 3 in four, and it was not specified in 141 patients (86%). Surgical correction was associated with fundoplication in n=160 children (97.6%; n=97 Nissen and n=63 Thal). Patch was not used in the majority of cases (n=160, 97.6%). There were seven conversions (4.3%), five recurrences (all in cases that did not use patch, and all required reoperation) and no mortality. Complications were reported in n=27 cases (16.5%), esophageal stenosis being the most common (n=24; only five required balloon dilation). Mean follow-up was 20.5 months (range 1-138 months).

CONCLUSIONS
Pediatric reporting on laparoscopic HH management is scarce, and important information is frequently omitted (e.g. neurological impairment, type of HH). The preferred approach is associated with Nissen/Thal fundoplication without patch. Recurrence occurred in 3% of cases, and complications were all minor, without mortality.

PW10UG05: THE EPIDEMIOLOGY AND ETIOLOGY OF ESOPHAGEAL ATRESIA AND ASSOCIATED CONGENITAL ANOMALIES: A SYSTEMATIC REVIEW OF THE RECENT LITERATURE

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INTRODUCTION & AIM
Esophageal Atresia (EA) with or without tracheoesophageal fistula (TEF) is the most common congenital malformation of the esophagus and trachea. Cited incidences of EA+/-TEF & associated congenital anomalies (ACA) vary and may change. We aimed to study recent insights on epidemiology and etiology of EA+/-TEF and ACA.

METHOD
Systematic review of the literature following the PRISMA guidelines, using various search terms in PubMed, Embase, Web of Science & Google Scholar, limited to original studies in humans from 2000-2018, in English, French, German and Dutch.

RESULTS
Out of 6491 papers, 123 relevant studies were selected for analysis (90% retrospective, mean number of patients/study 449,3). The worldwide average prevalence rate of EA is 2,96:10000 births. EA+TEF is more frequent (57,3-77,7%) than EA without TEF (11,5-42,7%) and TEF alone (6-21%). The mean sex ratio is 1,35. The mean overall survival is 88%. Risk factors for mortality are: prematurity, lower birth weight, presence of ACA, diagnostic delay, longer time to operative treatment, preoperative infection or ventilation, postoperative infection or thrombocytopenia. EA is "non-isolated" in 58,8%, with varying ACA frequencies (Fig.1) and etiological correlations.

CONCLUSION
Recent studies reveal shifting epidemiology and etiology of EA & ACA. Inconsistencies in the description of EA prevent larger comparison and urge more standardized reporting for EA:
1) anatomically: by the use of the Gross classification (type A-E), with description of gap length (centimeters or vertebral bodies),
2) ACA: "isolated" (absent) vs "non-isolated" (present), ideally specified as "nonsyndromic, nonchromosomal" (including VACTERL associations), "syndromic nonchromosomal" and "chromosomal" EA.

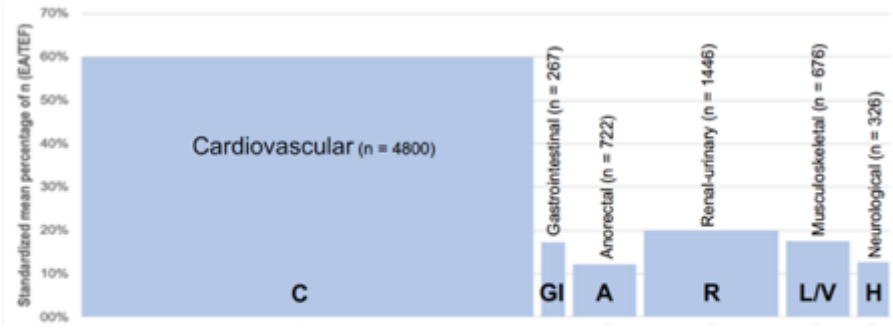

Fig.1: Most commonly observed and studied ACA in EA patients.
n = total number of observed EA pts over all studies, width of bar represents number of observed pts

PW10UG06: ANASTOMOTIC STRICTURES AFTER TYPE C ESOPHAGEAL ATRESIA REPAIR: TIMING OF DILATATION AND OUTCOME FROM A SINGLE CENTER EXPERIENCE

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[1]Pediatric Surgery Unit, "Spirito Santo" Hospital, Pescara, Italy. [2]"G. D'Annunzio" University, Chieti, Italy. [3]Pediatric Gastroenterology and Digestive Endoscopy Unit, "Spirito Santo" Hospital , Pescara, Italy

AMI OF THE STUDY
To assess the incidence of anastomotic strictures (AS) after Esophageal Atresia (EA) repair, focusing on their treatment and the impact on long-term gastroesophageal function.

METHODS
A retrospective study was performed about Gross type C EA who underwent succesfull thoracotomic primary repair between January 2006 and December 2016.
Data (n or median (range)) were compared using *t*-Student or χ^2-tests, when appropriated. A $p<0.05$ was considered significant.

MAIN RESULTS
31 patients were included. Gestational age was 39 (32-41), with 35% preterms; birth weight was 2815gr (1413-3690), with 19% LBW and 3% VLBW. Twenty/31 (65%) presented associated anomalies. Seven/31 (23%) anastomosis were under-tension (UTA).
AS occurred in 14/31 (45%), requiring 49 dilatation. Ten/14 (72%) patients started dilatations <6months of age and 4/12 (28%) >6months ($p<0.05$). When started <6months, 2 (1-5) dilatation were required *vs* 6 (1-10) if started after 6months, $p<0.005$.
Five/7 (71%) of UTA had AS vs 2/7 (29%) without AS, $p<0.0001$. Among 11 patients with GER, 7 (64%) had AS vs 4 (36%) without AS, $p<0.05$. After a 5years (2-12) follow-up, 20% of patients treated for AS still present dysphagia.

CONCLUSIONS
AS is the most frequent post-operative complication also in type C EA. Seventy-two% of dilatations started in the first 6months of life; the time of the first dilatation predicts the number of procedures that will be needed. Even when succesfully treated for AS, 20% of children continue to present dysphagia during a long-term follow-up. The limitation of the study is related to a follow-up performed before ESPGHAN-NASPGHAN 2016 guidelines.

PW10UG07: NEONATAL GASTRIC PERFORATION IN NEWBORNS: A TERTIARY CENTER EXPERIENCE

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AIM
To report our experience with neonatal spontaneous gastric perforation (NSGP) in a tertiary hospital over the last 10 years.

METHODS
Retrospective review of all neonates with NSGP treated in our center between January 2010 and December 2018. Both electronic and paper medical records were reviewed and the data retrieved included patients' demographics, perinatal clinical details, operative data and outcome. Cases with esophageal atresia, NEC or distal obstruction were excluded.

RESULTS
We identified 13 cases that fulfilled the fore mentioned criteria, 4 boys and 9 girls. Two neonates were full term with median birth weight (BW) of 3250 gm while 11 neonates were preterm with median gestational age of 28 weeks +3 days (range 24 -34 weeks) and median BW of 1185 gm. Abdominal distension and acidosis were the main presentation with free air detected in radiographs of all cases. PDA was the most common associated anomaly (53.8%). Eleven patients (84.6%) perforated between Day 2 and Day 9 of life. The most common site of perforation was the greater curvature (38.4%) followed by posterior wall (30.8%). Primary repair was performed in all cases. One neonate had recurrent perforation two days postoperatively and another presented with late adhesive obstruction. Five preterm neonates died giving a mortality of 38.5%.

CONCLUSION
NSGP is a rare condition now being seen more often in preterm neonates. Despite recent advances in intensive care, the prognosis is poor in preterm babies with multiple associated problems.

PW10UG08: COMPLICATIONS OF JEJUNAL FEEDING TUBES IN PEDIATRIC AGE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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AIM
Jejunal feeding tube (JFT) represents a route of enteral feeding for selected pediatric patients. Related papers in the Literature are sparse and lack consensus and complication rate is reported within an extremely wide range(1.6-20%). We systematically reviewed the outcome of JFT regarding postoperative complications. A meta-analysis was performed in order to define any differences in terms of positioning techniques (open, laparoscopic, endoscopic), age, underling disease and device used.

METHODS
Using a defined strategy (PubMed, Cochrane, Embase), three independent investigators reviewed all articles excluding adult series, case reports and, for specific goals, those papers in which the data of interest (technique, age, underlying disease and device) were not clearly reported. Meta-analysis was performed using Prism8Software with random-effects-model.

RESULTS
We screened 387 abstracts and included 21 articles (20 retrospective, 1 prospective) for a total of 562 patients, 664 complications (tube dislodgement and obstruction being the most common). There was not any significant difference related to technique (P=0.18), age (P=0.83) and device (P=0.18). The analysis could not be applied to underling disease indicating JTF (inconsistent data).

CONCLUSIONS
The indications for JFT are limited and the approach is generally a temporary nutritional strategy. Patients with neurologic impairment are most commonly involved and represent a diagnostic challenge in case of complications. When considering both major and minor problems, the complication rate of JFT is high, despite the positioning technique, age and device used. Most complications are related to tube maintenance. Therefore a strict follow-up, performed by dedicated experts, together with parent's education is fundamental.

PW10UG09: MANAGEMENT OF DYSPHAGIA IN THE NEUROLOGICALLY IMPAIRED CHILD: OUTCOMES OF A BOTTOM-UP APPROACH

Elisa Zambaiti[1], Calogero Virgone[1], Filippo Ghidini[1], Roberta Stefanizzi[2], Marina Andreetta[1], Francesco Fascetti Leon[1], Piergiorgio Gamba[1]
Elisa Zambaiti[1], Calogero Virgone[1], Filippo Ghidini[1], Roberta Stefanizzi[2], Marina Andreetta[1], Francesco Fascetti Leon[1], Piergiorgio Gamba[1]
[1]Pediatric Surgical Unit, Padua, Italy. [2]Pediatric Unit, Padua, Italy

AIM

Paediatric patients with neurological impairment usually suffer of alimentation disorders. In this setting, many would benefit of minimal procedures, gastrostomy placement only for instance, with the final aim to provide adequate food intake and reduce the risk of respiratory-related complications. Since years, our group favour a step-by-step approach with gastrostomy placement first and eventually plan of further procedures. This study aims to investigate outcomes of this approach.

METHODS

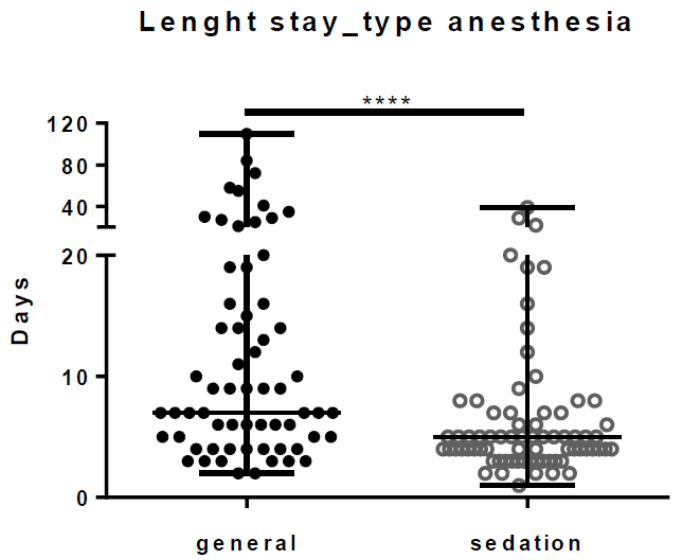
We included all consecutive patients undergone gastrostomy placement for dysphagia related to neurological impairment over a 10-year period (2008-2018). We compared different aetiologies of neurological impairment, technique of gastrostomy placement (open vs laparoscopic vs endoscopic), type and length of anaesthesia to post-operative need for ICU monitoring, time needed to full enteral feeding and length of hospital stay.

RESULTS

We included 141 patients. Median age at referral and gastrostomy placement were 2.2 and 3.2 years (SD 5,6) respectively. Median follow-up was 4 years (SD 10). Additional anti-reflux procedures were required in 25/141 patients (18%), tracheotomy in 23/141 (16%). Need of post-operative intensive care related to the type and length of anaesthesia ($p<0,002$). Days to full enteral feeding are less with endoscopic and laparoscopic techniques compared to open approach ($p<0,004$). Post-operative stay was longer following general anaesthesia or open surgical approach ($p<0,001$). Outcomes were independent of the aetiology of neurologic impairment.

CONCLUSIONS

Gastrostomy-placement-related-morbidity are probably due to length of procedure and type of anaesthesia rather than to the surgical technique. Analysed outcomes seem to favour, in this specific group of patients, a step-by-step approach.



PW10UG10: OESOPHAGEAL ATRESIA AND TRACHEO OESOPHAGEAL FISTULA ASSOCIATED WITH TETRALOGY OF FALLOT: A REVIEW OF MORTALITY

Kathryn O'Shea[1], Megan Griffiths [2], Alan King Lun Liu[3], Paul Losty[2], Matthew Jones[2], Joanne Minford[3], Fiona Murphy [2]
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AIM

Esophageal atresia +/- Tracheooesophageal fistula (OA/TEF) associated with congenital heart disease (CHD) carries a worse prognosis than OA/TEF alone. The Spitz classification takes CHD into account, however there is no data regarding survival within OA/TEF & Tetralogy of Fallot (TOF). With advances in neonatal intensive care survival in these complex patients is improving.
The aim of our study is to evaluate the morbidity & mortality associated with this combination of congenital anomalies.

METHOD

All neonates with OA/TEF & TOF treated in our institution between 1998–2018 were identified. Data were collected including, gestation, birth weight, associated anomalies, operative intervention, morbidity and mortality. All data was analysed in excel and SPSS.

RESULTS

319 OA/TEF patients were identified, 7 had OA/TEF with TOF. 3 males & 4 females. Median gestation = 32/40 (range 28 – 40 weeks). Median birth weight = 1200 g (range 1060 – 3330g). Overall survival in this series was 43% (3/7). All survivors remain under follow up (range 7-11 years). Surgical strategies for managing OA/TEF included 3/7 primary repairs of oesophagus and 4/7 ligation of TEF only (+/- oesophagostomy).

CONCLUSIONS

This is the largest subset analysis of OA/TEF with TOF presented in the literature. In this complex situation understanding the likely morbidity and mortality is vital both for parental counseling and to inform clinical decision making. Multidisciplinary working is crucial in the planning of care and operative intervention(s). Further multi-institutional data review may better inform risk stratification and decision making in this group of patients

PW10UG11: DOES SCOLIOSIS AFFECT FUNDOPLICATION OUTCOMES? A PRELIMINARY STUDY IN CHILDREN

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AIM
Funduplication may improve quality of life in neurologically impaired patients (NIP), however it is burdened by long-term complications in up to 20-30% of cases. Comorbidities, such as progressive scoliosis, may increase the risk of late complications. Our purpose is to evaluate the correlation between the worsening degree of scoliosis and the outcome after laparoscopic fundoplication(LF).

METHODS
We evaluated all NIP treated by LF from 2009 with a minimum follow-up of 3 years. The population was divided in: groupA=no/light scoliosis (Cobb<20°), groupB=moderate/severe scoliosis (Cobb>20°). The complication rate was evaluated and compared between the groups.

RESULTS
36 NIP were submitted to LF at a mean age of 67 months[10 months–18.5 years]. All had severe respiratory comorbidity and spasticity. At surgery 27 belonged to groupA and 9 to groupB. At long-term follow-up complications occurred in 6/36(16.6%): 4/27 in groupA(14.8%) and 2/9 in groupB(22%). The statistical study did not show significant differences between the two groups ($p<0.05$). However, at the time of complication development (6-7years afterLF), the severity of scoliosis of 2 patients in groupA had increased and they were upgraded to B. The new statistical comparison was significant ($p=0.0354$).

CONCLUSION

Although we know that co-morbidities of NIPcan affect their outcome after LF, in our series the degree of scoliosis at surgery did not seem to increase the risk of early complications. A close long-term follow-up is suitable to identify late complications due to the evolutionary nature of associated pathologies, such as scoliosis.

PW10UG12: DISCONNECTION PROCEDURE FOR ACQUIRED TRACHEO-ESOPHAGEAL FISTULA

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AIM OF STUDY
Acquired tracheo-esophageal fistula (TEF) is a rare condition, mostly due to delayed presentation of retained lithium watch battery in upper esophagus. A different sub-group is a TEF caused by erosion of esophagus due to candidiasis, secondary to human-immune deficiency virus (HIV). There is extensive fibrosis surrounding the TEF, which may result in major complications if dissection around TEF is attempted.

METHODS
Over a 15-year period (Jan 2004-Oct 2018), over 60 children with HIV-associated,esophageal strictures secondary to candidiasis, were managed. All children were between 3-9 years old. In three patients, a 5-10 mm acquired TEF was noted during dilatations. Anatomically, in two patients TEF was at the thoracic inlet and in one case at the carina. Ethics approval for retrospective collection of data was obtained.

MAIN RESULTS
Non-TEF esophageal strictures responded to retroviral/fluconazole therapy with repeated balloon or boogie dilatations.

In cases of TEF, spontaneous healing didn't occur with medication and gastric inter-position was carried out. The technique used was modified from standard esophageal replacement principles. Esophagus was disconnected in the neck and just above gastro-esophageal junction. This left about 15 cm of intact esophagus with TEF in posterior mediastinum. Gastric pull-up was done in the retro-sternal space. patients were discharged home 7-10 days after surgery. There were no complications on follow-up of 3-60 months.

CONCLUSIONS
Disconnection procedure appears to be safe and avoids thoracic inlet or carinal dissection. However long-term follow up of > 10 years is required to address concerns about retained esophagus/TEF.

PW11LG01: LAPAROSCOPIC MANAGEMENT OF PEDIATRIC CROHN'S DISEASE (CD): SINGLE CENTER EXPERIENCE

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AIM OF THE STUDY
To review our experience in CD's surgery regarding surgical indication, procedures performed and outcomes.

METHODS
A retrospective descriptive review of CD patients who underwent surgery from 2012 to 2018 was performed. Perianal disease surgery was excluded. Demographic, clinical, endoscopic and surgical data were analyzed.

MAIN RESULTS
28 patients underwent surgery (50% males). Mean age at surgery was 12.99±2.34 years. Mean time from CD diagnosis until surgery was 2.63±2.11 years. Disease onset behavior was: 44.4% inflammatory presentation, 40.7% stricturing presentation, 3.7% penetrating and 11.1% a combination of both. 85.2% had terminal ileum involvement and 14.8% colonic disease. Main surgical indications were intestinal stricture with obstructive symptoms (85.71%) and intrabdominal abscess with or without enteric fistulae (10.71%). Minimal invasive surgery was used in all cases; 14.3% were converted to open surgery. Most common procedures performed were ileocecal resection (77.4%) and strictureplasty (7.14%).
Mean surgical time was 237±70.2 minutes and hospital stay 8.04±3.57 days. Only one minor surgical complication (wound infection) was found.
After surgery, biological treatment was used in 96.43%. Follow-up endoscopy was performed in 57.14% showing no recurrence in 81.2% (Rutgeerts' score <2).
90% had no clinical relapse (PCDAI: Pediatric Crohn's Disease Activity Index <10) with a mean follow-up of 2.48 years.

CONCLUSIONS
Minimal invasive surgery for stricturing and penetrating CD is safe and effective with low morbidity. CD's surgical treatment should be an integral part in its overall management, as patients enjoy years of symptomatic improvement.

PW11LG02: INFLUENCE OF SURGICAL TIMING IN PATIENTS WITH HIRSCHSPRUNG DISEASE

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AIM OF THE STUDY

Single-stage endorectal pull-through (ERPT) is the common surgical treatment of rectosigmoid Hirschsprung disease (HSCR). The aim of the study was to analyse surgical outcomes after ERPT according to the age at surgery.

METHODS

A retrospective study was performed from 2014 to 2018 in non syndomic rectosigmoid HSCR patients treated by ERPT. Patients were stratified by operative age < 28 or >= 28 days of life (groups Newborn and Infants). Patients characteristics, data on preoperative, postoperative management, surgical complications and functional outcomes were collected.

MAIN RESULTS

Twenty consecutive patients were included in this study. Median age at surgery was 50 days (28-135 days) in Infant Group and 11 days (7-24 days) in Newborn Group. The median follow-up was 34 months (9-56 months).

The rate of complications was lower in the Infant Group than in the Newborn Group: 1/9 (11%) and 5/11 (45%), the hospital length of stay was 3,7 days (2-5 days) and 5,7 days (3-8 days) respectively. In Newborn Group, 5 patients had anal stenosis, of whom 2 (18%) with enterocolitis (one who required botulinum toxin injection). One Infant presented an anal stenosis with enterocolitis. Constipation rate was higher Newborn Group (2/11, 18%) and not observed in Infant Group. No statistically significant correlations were observed for those results.

CONCLUSIONS

Patients with HSCR who underwent ERPT >= 28 days of life seems to have lower rate of postoperative complications and better functional oucomes when compared to younger patients. Furthers studies will be necessary to confirm our results.

PW11LG03: URINARY TRACT ANOMALIES IN PATIENTS WITH ANORECTAL MALFORMATION (ARM). THE ROLE OF SCREENING AND LONG-TERM FOLLOW-UP

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Urinary tract anomalies (UA) are frequently seen in ARM patients (ARM-P).
The need to screen and follow asymptomatic patients with ultrasonography of the urinary tract (U-US) is currently debated and it is not clear if it is necessary for all patients .
This study aimed to evaluate the efficacy of urological monitoring plan in ARM-P, for detecting UA and neurogenic lower urinary tract dysfunction (NLUTD).

Data of ARM-P born between 2000-2016 in a single centre were collected regarding type of ARM, UA detected at birth or at the following assessments as per centre protocol, treatment and follow-up length. Bivariate analysis was performed.

We identified 150 ARM-P in the study period. Data were available in 120. Mean follow-up was 8.9 years. UA were found in 35 cases at birth (29%) with a significant difference between high and low ARM (P=0.045).Hydronephrosis and renal dysplasia were seen most in neonatal period with an incidence of 13.3% and 5.8% respectively .18/85 (21%) had US detected problems while normal at birth (10 vescicoureteral reflux VUR 11.7%, 8 NLUTD 9.3%). 15/35 cases with abnormal neonatal U-US (42.8%) developed NLUTD. NLUTD occurred in 87% of patient with lumbosacral or spinal cord anomalies.

This study suggests that urinary tract screening at birth along with spinal cord imaging can detect 83% of patients (44/53) with risk of UA in ARM-P. Long term UT follow-up program can detect 17% of total abnormalities (9/53). This data has to be considered during counselling and when planning follow-up for these patient.

PW11LG04: 50% GLUCOSE INJECTION IN PRESACRAL SPACE FOR RECTAL PROLAPSE IN CHILDREN

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AIM OF STUDY

A wide variety of sclerosing agents have been used in rectal submucosa in treatment of rectal prolapse in children.We have used 50% glucose in presacral space for the first time in the treatment.The aim of this study is to review the results of a 50% glucose injection in presacral space.

PATIENTS AND METHODS

In this study we included children who failed to respond to conservative treatment.The outcome OF 50% glucose injection sclerotherapy and the presence of complications were investigated.Under general anesthesia,the patient was placed in the lithotomy position.The left index finger was inserted into the rectum to control the position of the needle.A 20-gauge spinal needle was introduced through the perianal skin and was advanced.The 50% glucose was slowly injected through presacral space into,the right perirectal area the left perirectal area and posterior to the rectum at3points.The injection was continued until 5-6 ml of 50% glucose were injected in each quadrant.

RESULTS:
A total of15children with complete rectal prolapse aged from4to 7 years,were treated between2012until 2015.Conservative treatment had previously failed in all patients. All of them were cured after one injections without any recurrence. Only one patient led to presacral abscess that underwent derange. There were no other complications. No fecal soiling was seen.

CONCLUSIONS:

The success rates and complications of the treatment reported in the literature differ for each sclerosing agent. Injection sclerotherapy by50%glucose for treatment rectal prolapse in children is a simple and effective treatment.

Key words:50% glucose,rectal prolapse,sclerotherapy

PW11LG05: FECAL CALPROTECTIN AS A NON-INVASIVE BIOMARKER IN VERY LOW BIRTH WEIGHT INFANTS WITH NECROTIZING ENTEROCOLITIS

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AIM OF THE STUDY

To evaluate level of fecal calprotectin (fCal) in infants with very low birth weight (VLBW) with necrotizing enterocolitis (NEC) and its correlation with clinical signs, laboratory and radiological findings.

METHODS

The open, prospective study has performed at neonatal intensive care unit, from 1th January - 31th December 2018, involving VLBW infants with gastrointestinal disorders, as the intolerance of the oral entry, abdominal distension and/or blood presence in stool. The first sample of stool was taken within 24 hours of the onset of gastrointestinal disorder and the next day we took the second sample. The classification of the NEC was confirmed with the modified Bell staging criteria. Stool samples analyzed by enzyme-linked immunosorbent assay (ELISA). The present study was approved from Trust Ethical committee, according to the revised version of the Declaration of Helsinki.

MAIN RESULTS

The study has included 13 VLBW infants (9F, 4M) with mean gestational age of 28 weeks and a birth weight of 868 g. Eight infants developed NEC. We found significantly higher fCal level in NEC patients than in non-NEC patients (for the first sample the p-value was .02081, $p < .05$, $p > .01$, and for the second sample the p-value was .000144, $p < .01$).

CONCLUSIONS

Fecal calprotectin levels is significantly increased in VLBW infants with NEC. It is useful and non-invasive test, with potential for early diagnosis of NEC, but further research is needed to establish its clinical usefulness.

KEY WORDS
necrotising enterocolitis, biomarker, fecal calprotectin, very low birth infants, Bell staging

PW11LG06: LAPAROTOMY OR PERITONEAL DRAINAGE FOR THE MANAGEMENT OF SURGICAL NECROTIZING ENTEROCOLITIS – A 25-YEAR RETROSPECTIVE CHART REVIEW

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AIM OF THE STUDY
Necrotizing enterocolitis (NEC) is a devastating inflammatory disorder affecting the neonatal gastrointestinal tract, frequently requiring surgical intervention. We aimed to determine which surgical strategy, laparotomy (LAP) or peritoneal drainage (PD), resulted in better clinical outcomes.

METHODS
We performed a retrospective cohort study of infants with surgical NEC from 1991 to 2016. The surgical management strategy received, LAP or PD, defined cohorts. The primary outcome measured was survival at 30, 60, and 180 days. Secondary outcomes were length of stay (LOS) and days to full enteral feeds (dFEF). Both univariate and multivariate analyses were conducted. The latter used a propensity score matching technique to account for possible confounding variables; gestational age, birth weight, respiratory distress syndrome, metabolic acidosis, and thrombocytopenia.

MAIN RESULTS
77 patients met the inclusion criteria, 26 LAP and 51 PD.

	LAP	PD	P value	
			Univariate analysis	Multivariate analysis
Total	26	51		
30 days survival	21 (80.8%)	38 (74.5%)	0.54	0.42
60 days survival	15 (57.7%)	31 (60.8%)	0.80	0.84
180 days survival	15 (57.7%)	27 (52.9%)	0.70	0.59
Mean LOS (days)	79	116	0.03	0.27
dFEF	42	67	0.02	0.15

CONCLUSIONS
Our data suggest that the choice of surgical intervention, LAP or PD, for infants with NEC does not influence survival at 30, 60, or 180 days. LAP patients tend to have shorter LOS and dFEF, suggesting that LAP may expedite clinical progress and be more cost-effective. However, these differences were not statistically significant after multivariate analysis.

PW11LG07: BIOMARKERS TO DIFFERENTIATE BETWEEN SIMPLE AND COMPLEX APPENDICITIS IN CHILDREN: A SYSTEMATIC REVIEW

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AIM
Appendicitis can be classified into two entities: simple and complex, which may require specific different treatment strategies. However, pre-treatment differentiation remains difficult. Therefore, the aim of this systematic review was to identify potential biomarkers in serum, urine and faeces, and assess their diagnostic value.

METHODS
Systematic searches in Pubmed, Embase and Wiley/Cochrane Library were conducted from January 1st 2000 till November 21st (Pubmed) and November 29nd (Embase/Cochrane) 2017. Eligible for inclusions were randomised controlled trials (RCTs), prospective and historical cohort studies investigating potential biomarkers in serum, urine and faeces in children (<18 years) with appendicitis. Methodological quality of individual studies was assessed using QUADAS-2. For all biomarkers we tried to calculate positive and negative likelihood ratios (LR+ and -), sensitivity and specificity.

MAIN RESULTS
In total, 6286 articles were screened. Forty-one articles were included, reporting on fifty biomarkers measured in serum, thirteen in urine and one in faeces. Definitions of simple and complex appendicitis were inconsistent; including terms as simple, early, non-perforated, gangrenous, perforated, severe, complex and complicated appendicitis. For seventeen biomarkers, data could be extracted of diagnostic accuracy parameters. Apart from C-reactive protein (CRP) and white blood cell count (WBC), promising results were found for Interleukin-6; LR+ ranging from 2.21-4.00; LR- 0.06-0.44; sensitivity 0.64-0.96; specificity 0.59-0.82.

CONCLUSION
In addition to CRP and WBC, Interleukin-6 in serum could be a promising biomarker differentiating simple from complex appendicitis. Nevertheless, for future research and clinical implementation, consensus on uniform definitions of simple and complex appendicitis should have a high priority.

PW11LG08: EVALUATION OF THE CALRETININ AND NO IHC STAINING IN GANGLIONIC SEGMENT OF COLON OF CHILDREN WITH HIRSCHSPRUNG DISEASE

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AIM OF STUDY
Recent evidence suggests that patients with Hirschsprung disease (HD) have abnormal neurotransmitter expression in the ganglionated proximal colon. These alterations may cause persistent bowel dysfunction even after pullthrough surgery. We conducted a single institution case- series study to evaluate the calretinin and NO IHC staining in ganglionic segment of colon of HD patients.

METHODS
The proximal resection margin from 60 patients with colonic HD who underwent a pullthrough procedure was immunohistochemically examined. The incidence of constipation, incontinence, and voluntary bowel movement in HD patients was assessed and correlated with the IHC staining.

RESULTS
In this study a total of 60 children with HD were enrolled. Overall 14 patients (23.3) were symptomatic 6 months after surgery. In the IHC examination, nuclear and cytoplasmic calretinin attaining revealed ganglion cells in 54 patients as stronglypositive ansd weakly positive in 6 patients . Four patients (age≥3 years) in strongly positive group (7.4%) was symptomatic in first month post operative evaluation, while all 6 patients whose calretinin staining was reported as weakly stained, had symptoms in first month post operative evaluation (P=0.001). We found that calretinin staining intensity was highly correlated with post operative symptoms (r=0.074, P=0.001). In colo-rectal samples from ganglionic segments of symptomatic patients (14 patients), all samples were negative for NOS staining.

CONCLUSION
For children with HD who scheduled for operation, we had found the predictive value of IHC staining of proximal ganglionated segment of colon for post operative bowel function

PW11LG09: THE DEVELOPMENT OF A LOW BUDGET MODEL FOR THE TRAINING OF AN POSTERIOR SAGITTAL ANORECTOPLASTY

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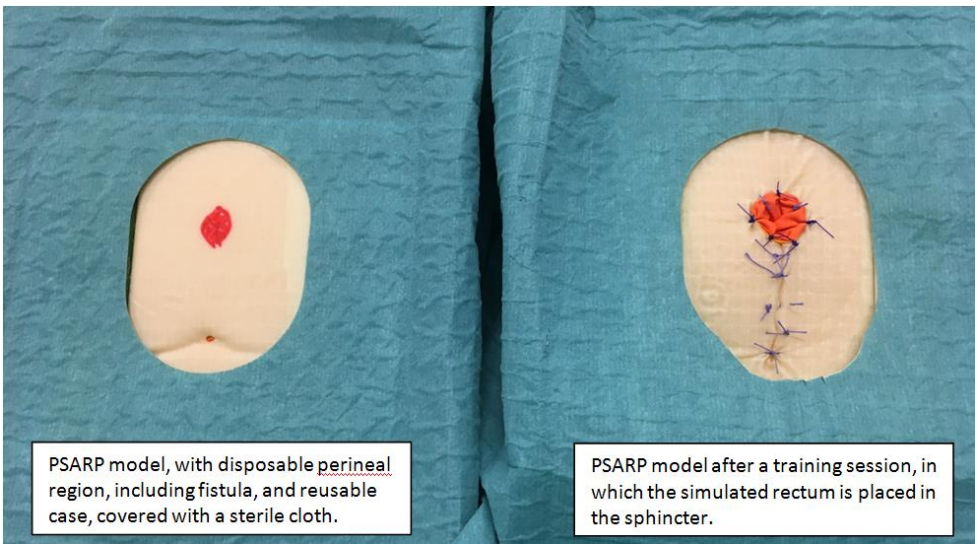
AIM
An Anorectal Malformation (ARM) most often will be corrected with a posterior sagittal anorectoplasty (PSARP), especially for the simple types. Because this is a relatively rare malformation, that requires a complex reconstruction, it could be beneficial to develop an affordable training model to train these component steps outside the patient.

METHOD
The aim of this study was to develop a low-cost three-dimensional ARM model with recto-perineal fistula. It had to be affordable, easy to use and (partly) reusable, to make sure it is feasible to use by all pediatric surgeons (both in developed and lower income countries).
The PSARP was divided in component steps and as many steps as possible were incorporated to train on the model.

RESULTS
The base is a triangular shaped casing, with a box centrally, including the coccygeal bone cranially, which was 3D printed and reusable. The perineal body consisted of a disposable sponge, layered with rubber gloves, simulating the skin and fascial layer (Figure). The rectal fistula was simulated with a double layered balloon, glued to each other and the sponge. This sponge can be inserted in the box of the reusable base.
The following five steps can be trained: Placing sutures around fistula; Sagittal opening in midline; Dissection fistula/ rectum; Reconstruction of sphincter complex; Anoplasty. The focus of the model is the structured approach, because realistic dissection is difficult to simulate, especially in a low cost model.

CONCLUSION
We developed an affordable, partly reusable, model to train the component steps of the PSARP.



PW11LG10: NECROTISING ENTERO-COLITIS 10 YEARS LATER: HAS THE BRAIN TAKEN A HIT?

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AIM OF THE STUDY
Severely premature babies may have poor neuro-developmental outcomes, especially if they develop necrotising enterocolitis (NEC). There is a dearth of long-term follow up studies in this field. We therefore conducted a neurodevelopmental assessment of babies diagnosed with NEC more than a decade ago.

METHODS
NICU register was searched for patients diagnosed with NEC between January 2007- December 2008. A retrospective review of notes and telephone interviews with parents was conducted. Evidence of motor, cognitive and sensory impairment was recorded.

A meta- analysis was done to assess the current state of literature regarding neurodevelopment impairment in children with NEC.

RESULTS
The overall ortality in this cohort was 31%.

With some difficulty, 18 patients were traced and followed up at an average age of 11.2 years. 11/18 **(61%)** had neurological impairment. 10/15 (67%) surgically managed patients and 1/3 (33%) medically managed patients had impairment. Cognitive impairment, including learning difficulties, was the most common (10/18, 56%), followed by speech difficulties (4/18, 22%), cerebral palsy (4/18, 22%), behavioral conditions (3/18, 17%), visual impairment (2/18, 11%) and seizures (2/18, 11%).

Review of the literature revealed that the majority of studies reported neurological followup at only 2 years of age.

CONCLUSION
In the field of NEC, there is a hidden neurological burden that neonatal surgeons bequeath to the community. 61% are neurologically impaired which affects quality of life and function in the long-term. There should be appropriate parent counselling at point of diagnosis and regular development checks for children with NEC.

PW11LG11: RE-EVALUATION OF PRIMARY INCONCLUSIVE BIOPSIES AT INTENDED FULL-THICKNESS RECTAL BIOPSIES IN THE DIAGNOSIS OF MORBUS HIRSCHSPRUNG

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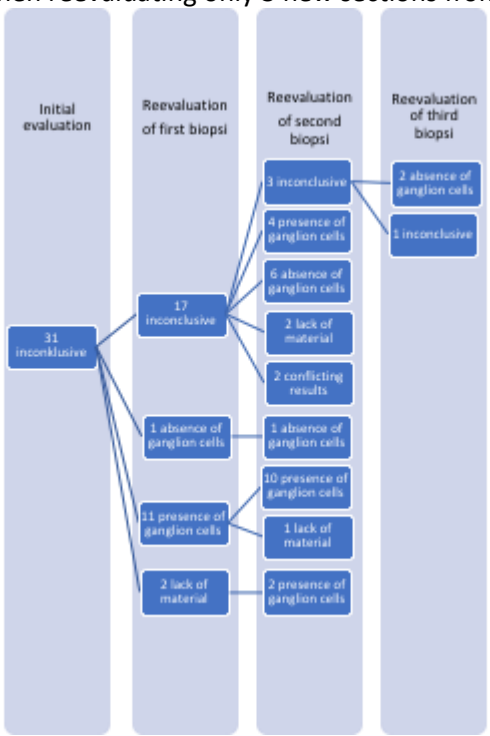
AIM OF THE STUDY
Was to investigate whether a reevaluation of archived bank tissue with haematoxylin (HE), S100 and calretinin staining would change the primary pathological diagnosis.

METHODS
From 01-01-2008 to 31-12-2014 a total of 593 full thickness biopsies (FTB) in 555 patients were performed. A total of 31 were deemed inconclusive initially, primarily because the myenteric plexus wasn't present. All 31 patients had a secondary biopsy, and further 3 a tertiary biopsy to obtain a conclusive FTB.
Three new sections from each tissue block were cut and stained with HE and antibodies towards S100 and calretinin (IHC). A blinded pathologist examined the new sections and divided them into: inconclusive, absence or presence of ganglionic cells.

MAIN RESULTS
Reevaluation of the 31 biopsies resulted in 12 (39%) conclusive biopsies on HE staining alone, 11 with presence of ganglion cells and one without. Seventeen (53%) biopsies were still inconclusive despite IHC staining. At reevaluation of the second biopsies the HE and IHC staining results were the same except in 2 patients where there were conflicting results.

CONCLUSION
We found that 39% of initially inconclusive biopsies were conclusive at further reevaluation and even superficial biopsies without the myenteric plexus proved to be sufficient and safe for ruling out Mb. Hirschsprung when reevaluating only 3 new sections from the same tissue block.



PW11LG12: USEFULNESS OF GANGLIA DETECTION IN THE RECTUM/FISTULA OF PATIENTS WITH ANORECTAL MALFORMATION

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BACKGROUND
The occurrence of Hirschsprung disease in patients operated for anorectal malformation (ARM) is very rare, but many surgeons still ask to pathologists to search for ganglia in the terminal rectum or fistula. The histological procedure to detect the ganglia is time and money consuming and, in these particular patients, the results may be confounding. A consecutive series of ARM patients, in which the presence of ganglia in terminal rectum was searched, is reported.

MATERIALS
The rectal specimen of patients with ARM who underwent corrective surgery in the last 6 years were retrieved. The protocol to investigate the presence of ganglia included H&E staining and calretinin immunohistochemistry. Each specimen is processed until all material is examined if no ganglia are retrieved after the first twelve sections.

RESULTS
Twenty-nine ARM cases were examined. Nine patients were younger than 1 month of age at operation. The mean length of the specimen was 1,5cm (range: 1-3cm). Upon clinical request, ganglia were searched in 10/29 cases (34%) and resulted absent in 4/10 (40%). All patients have been regularly followed in the outpatient dedicated clinic and none, including those without ganglia, developed signs or symptoms suggestive for Hirschsprung.

CONCLUSIONS
The practice to search for ganglia in the terminal rectum/fistula in ARM patients should be abandoned as incidence of associated colorectal diseases is exceptional and may lead to surgical overtreatment with devastating consequences. Moreover, the procedure is expensive both in terms of laboratory's reagents and working time of expert pathologists and technicians

PW12UR01: POST-OPERATIVE OUTCOME FOLLOWING ORCHIDOPEXY IN CHILDREN WITH TESTICULAR-EPIDIDYMAL NON-FUSION

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AIM OF THE STUDY
To appraise the results of orchidopexy in children with undescended testis and testicular-epididymal non-fusion (TENF).

METHODS
Retrospective review (2010-2018) of children with TENF noted intra-operatively (Ethics RES-18-0000-319Q). Cases were matched with controls (normal fusion) for age at surgery. Records from follow-up visits were assessed to determine post-operative testicular size and position. Data are reported as number of cases (%), median (range), odds ratio [OR] and analysed using the Mann-Whitney and Fisher's exact tests.

RESULTS
Orchidopexy was performed on 219 patients (252 testes); 54 testes (21%) had TENF while 198 (79%) exhibited normal fusion. Age at surgery was 1 (0.1-16) year for TENF and 1.6 (0.1-15) years for normal fusion (p=0.13). TENF was more prevalent in intra-abdominal (22%) than inguinal (11%) testes [OR 2.4 (1.1-5.2), p=0.04].

Follow-up findings are shown in the table below.

Characteristic at follow-up	TENF (n=47)	Normal Fusion (n=42)	P value
Lost to follow-up	7	12	
Duration of follow-up (months)	8 (6-24)	7 (2-15)	0.11
Small testicular size at follow-up	16 (34%)	10 (24%)	0.18
Scrotal position at follow-up	46 (98%)	40 (95%)	0.49

CONCLUSIONS
In our experience, over 20% of undescended testes have a degree of TENF. Testes that are intra-abdominal are more likely to exhibit TENF. At short-term follow-up, we found no differences in testicular size and position. There is, however, need for large prospective studies on the long-term follow-up in children with TENF to better understand its implication on testicular development and function.

PW12UR02: LASER PUNCTURE OF URETEROCELE

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AIM
To evaluate the effectiveness of holmim-laser puncture and electrosurgery-incision of the intravesical ureterocele in neonates.

MATERIALS AND METHODS
We retrospectively analyzed the results of laser-puncture of ureterocele (LP group) in 14 patients (mean age 9.8 days, range 4-28) and electrosurgery-incision in 20 patients (ES group) (mean age 10.2 days, range 6-28). Patients had their records reviewed for preoperative findings, procedure description, and postoperative outcomes.

RESULTS
There was the need for retreatment in one (7.4%) patient in LP group and in four (20%) patients in ES group (P = .526). Duration of anesthesia in LP and ES groups was 16 (range, 10-24) minutes and 15 (range, 10-20) minutes, respectively (P = .355). There was no statistically significant difference in terms of hospitalization (LP group one day, ES group 1.35 days) (P = .286). Complications were not found in LP group. There were two (10%) patients with pyelonephritis after the treatment in ES group (P = .516). After one month, obstruction was observed on ultrasound examination in one (7.4%) and two (10%) patients, respectively. After three months, obstruction was not found in any patient. After six months, vesicoureteral reflux was found in one (7.4%) patient after laser-puncture of the ureterocele and in 13 (65%) patients after electrosurgery-incision (P = .003).

DISCUSSION
Both laser-puncture and electrosurgery-incision techniques are highly effective in relieving the obstruction. The incidence of de novo vesicoureteral reflux is significantly lower in patients treated with holmium-laser, as well as the need for upper pole partial nephrectomy.

PW12UR03: PIETRAN PIGLETS AND JUVENILE AACHEN MINIPIGS ARE EQUALLY SUITABLE MODELS IN EXPERIMENTAL PAEDIATRIC UROLOGY

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AIM OF THE STUDY

Pigs had special roles in development of minimally invasive procedures to treat vesicoureteral reflux as the only animal species with multi-papillary kidneys. The STING-procedure was developed and refined in landrace piglets, whereas the laparoscopic Lich-Gregoir-procedure was first demonstrated in Hanford Minipigs. They combine small size with a less vulnerable adult physiology. We aimed to determine whether a Minipig breed might be equivalent to domestic pigs.

METHODS

We compared five three-week old Pietrain piglets (5.2kg±0.8) with five three-month old Aachen Minipigs (4kg±0.3) (permit: G-17-1-033). Kidneys were explanted, weighed, and their size was determined as was ureteral length. We also calculated renal volume using the ellipsoid formula (4/3π•½length•½thickness•½width), and estimated the bodyweight-corrected glomerular filtration rate using Gusthuys' formula [(1.879•bodyweight$^{1.092}$)/plasma creatinine$^{0.6}$]. Groups were compared by *t*-tests with adjustments for multiple comparisons according to Benjamini-Hochberg (corrected statistical significance q*<0.0071). We also compared our results to human reference data of infants aged around two months. Values are mean±SD.

MAIN RESULTS

While Pietrain piglets were *a-prioi* heavier than Aachen Minipigs (Δ=1.2kg, 95% CI: 0.2–2.1kg, *P*=0.0242), all other parameters did not differ (table). The results of both breeds were also within proximity to human data.

CONCLUSIONS

Anatomical parameters as well as renal function are similar between both pig breeds and not far from humans. If catch-up growth of renal function after nephron-sparing surgery is irrelevant, Minipigs might be more suitable to advance minimally-invasive paediatric urology due to their less vulnerable physiology.

	Pietrain	Aachen Minipig	*P*-value	Human
Left kidney weight	17.4g±5.4	14g±2.1	0.2201	21g±16[a]
Right kidney weight	17.3g±4.3	13.3±1.5	0.0836	20g±14[a]
Left renal volume	11.2mL±4.4	8.7mL±1.6	0.2693	16.4mL±2.9[b]
Right renal volume	11.2mL±3.4	8.4mL±1.5	0.131	14.9mL±2.6[b]
Estimated renal function	13.7mL/kg±3.3	12.4mL/kg±1.2	0.4433	–
Left ureteral length	9.4cm±2.3	11.7cm±0.6	0.0869	~8cm[c]
Right ureteral length	9.8cm±1.5	12.1cm±0.8	0.0164	~8cm[c]

[a]2 months old; Thompson et al., DOI: 10.1520/JFS2003288

[b]1-3 months old; Shi et al., DOI: 10.1016/j.jpedsurg.2015.05.011

[c]~2 months old; Coffelt et al., DOI: 10.1016/S0022-5347(17)70966-4

PW12UR04: A CHILD'S PERSPECTIVE OF VIDEO-URODYNAMIC ASSESSMENT

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AIM

We aim to explore child's perspective of emotions felt during video-urodynamics (VUD) and to identify if the type of catheter placement (suprapubic or urethral) affects it.

MATERIALS AND METHODS

Single-centre, prospective, age-appropriate anonymised questionnaire study of VUD in children aged 5-11 years, over 5 month period. Questionnaire completed by child immediately following investigation. Questions regarding discomfort (Wong-Baker FACES pain rating scale for 5-7 years and visual analogue score for 8-11 years, and emotions (emoticons in 5-7 years and visual analogue scale in 8-11 years) related to VUD were recorded, mean overall score presented.

RESULTS

No difference was found.

N=54	5-7 years			8-11 years	
	Suprapubic catheter n=5	Urethral catheter n=9		Suprapubic catheter n=10	Urethral catheter n=30
Pain score	4.4/10	4.4/10		2.4/10	2.1/10
Emotions					
scared	20%	20%		4.5/10	4.3/10
worried	40%	45%		5.4/10	4.3/10
embarresed	21%	22%		2.3/10	2.4/10
happy	20%	33%		6.1/10	6/10
ok	21%	21%		6.3/10	6.6/10

CONCLUSION

The results of this study shows an overall low level of discomfort experienced by children between 5- 11 years of age and the type of catheter used (suprapubic and urethral catheter) did not make difference.

PW12UR05: MEDICAL EXPULSIVE THERAPY FOR URETERAL LITHIASIS IN PEDIATRICS

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AIM
The incidence of pediatric urinary lithiasis has increased in the last two decades. Medical expulsive therapy (MET) for ureteral lithiasis has been successful, but few reports in pediatrics exist. The aim is to present our results with MET in pediatric population.

METHODS
Retrospectively reviewed patients with ureteral lithiasis, aged<18yo, between 2011-2018. Demographics, age at diagnosis, calculi localization, size, symptoms, concomitant kidney lithiasis, therapy, and follow-up were collected. Statistical analysis performed for recurrence predictive factors. *p-value*<0.05 considered statistically significant.

RESULTS
Total of 27 cases, mostly female (59%), the median age at diagnosis 16yo [3-17]. Three patients had previous uropathy and five had medical conditions prone to lithiasis. In 82% the calculi were located in distal ureter, with 2 cases in proximal ureter. Median calculi size was 6,8mm [4-15mm]. Renal colic was the presentation in 92%, with no age relation. 54% had concomitant kidney lithiasis. MET was started in 74% cases, of which 65% had ureteral stenting. One patient had ureterorenoscopy(URS) as first-line therapy and 1 case of open surgery for uropathy correction. In MET group, 70% had resolution, 21% didn't eliminate the calculi requiring following URS, 10% recurred with following URS. No adverse effects of MET were found. Neither stone localization(p=0,06), dimension(p=0,56), nor associated kidney lithiasis were statistically associated with resolution after MET. In logistic regression, no variable was predictive of recurrence after MET.

CONCLUSIONS
This study reinforces that MET is safe and surgery-sparing for ureteral lithiasis disease, and should be used as first-line whenever possible.

PW12UR06: PROXIMAL URETEROCYSTOPLASTY: A VARIANT OF OPERATIVE TECHNIQUE

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OBJECTIVE
Bladder augmentation with the ureter is considered as an ideal augmentation. However, the procedure as previously described requires the use of the massively dilated ureter of a nonfunctional kidney, or using the mid and distal ureter with preservation of the ipsilateral functioning renal unit with complicated transureteroureterostomy. In such cases the essential vascularization is often based on the retrograde circulation. Our variant of ureterocystoplasty involves the use of megaureter/s of the functioning kidney/ies, without separation from the proximal urinary tract and proximal circulation.

PATIENTS AND METHODS
We treated 3 children with neurogenic bladder and 2 with bladder exstrophy. In 3 children, we used both megaureters of the functioning kidneys for bladder augmentation on the proximal circulation. In 2 children the unilateral megaureter of the functioning kidney was used for augmentation. The sagittal half of the distal part of the same refluxing megaureter on the retrograde circulation, was used to form the continent vesicostomy (3). In 4 patients the antireflux mechanism was performed, so that a 1.5 cm nipple was formed by ureteral intussusception. The nipple was stabilized with sutures to the detrusor.

RESULTS
After 2,5 and 21 years follow-up, a considerable increase in the capacity of the urinary bladder was achieved in both patients. Four patients are on clean intermittent catheterization, fully dry by day and night like patients who void spontaneously.

CONCLUSION

Our method enables considerably wider possibilities to use the ureter for bladder augmentation, even after surgery of the ureterovesical junction. The total procedure may be done extraperitoneally.

PW12UR07: PROGNOSTIC CALCULATOR OF THE EFFECTIVENESS BOUGIENAGE AND STENDING IN CHILDREN UNDER 3 YEAR OLD WITH URETEROPELVIC JUNCTION OBSTRUCTION

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AIM
to develop a mathematical model for predicting the effectiveness of transureteral bougienage and stenting (TUBS) in children under 3 years old with ureteropelvic junctionobstruction (UPJO).

MATERIALS AND METHODS
A retrospective analysis TUBS for the correction of UPJO was carried out for 70 patients aged 1-36 months with II-IV grade hydronephrosis (SFU). There were 28 children up to 6 months (41.7%), 15 aged 6-12 months (22.3%), 19 aged 12-24 months (28.6%) and 5 over 2 years (7.4%). Efficiency evaluation by diuretic renal ultrasound after 6, 12 and 24 months. Iterative algorithm was constructed using the software package MATLAB based on the analysis of 25 studied indicators using the logistic regression method. The model was transferred to the software package (prognostic calculator), which shows the percentage probability of success of the TUBS.

RESULTS
Effectiveness TUBS after 6 months - 88.5% (n = 62), 12 months - 71.5% (n = 50) and 24 months - 61% (n = 43). No statistically significant differences were found in studied parameters. Data from two groups of patients were evaluated using the calculator as a tool for retrospective analysis. In first group of children (n = 27) who underwent pyeloplasty within 2 years after TUBS, the probability of success of TUBS did not exceed 19%. In a group of patients (n = 43) with positive results of TUBS, the probability of success was more than 76%.

CONCLUSION
The created prognostic calculator allows to individualize the approach to the choice of surgical technology.

PW12UR08: THE RESULTS OF CLITOROLOPLASTY WITH MORPHOLOGY OF THE SENSITIVE ZONES OF CLITORIS

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AIM OF STUDY
Evaluate the results of clitoral plastic surgery in children with disorders of sexual development with a morphological study of the resected sections of the head of the clitoris.

METHODS
There were operated 114 patients. The main part performed two-stage correction of the genitals - 108 (94%). 79 (69%) children underwent feminizing plastic surgery according to A.B. Okulov, 35 (31%) performed feminizing plastic with preservation of the dorsal vascular-neural bundle. Among this group in 29 (25%) removal of excess tissues of the head of the clitoris along the lateral surfaces and in 6 (5%) along the ventral surface was performed.

Control examination of patients after plastic was performed on the 30th, 90th, 360th day, the appearance of the genitals was assessed for feminine type and clitoral reperfusion timing (CRT).

18 patients (15%) underwent morphological examination of the resected sections of the clitoral head.

RESULTS
Cosmetic results showed no significant differences. CRT in the group where the plastic was performed by according to A.B. Okulov was higher in comparison with the groups with preservation of the dorsal vascular-neural bundle (p=0,003).

With microscopy revealed that the head of the clitoris is rich in nerve trunks and tactile bodies, which are located mainly on the ventral and dorsal areas of the head of the clitoris.

CONCLUSIONS
In the conduct of clitoroplasty, preference should be given to methods with preservation of the dorsal vascular-neural bundle. At resecting the head, the ventral and dorsal surfaces of the organ should be preserved.

PW12UR09: PELVIC FRACTURE URETHRAL INJURY (PFUI) IN CHILDREN

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AIM
Pelvic fracture with urethral injury is not a common problem in children population. Published series on this subject include small number of patients. The aim of the study is to present surgical approach PFUI in children, at our center.

METHODS
From January 2012 until July 2018, 6 boys, aged between 11 and 17 years, had pelvic fracture with posterior urethral injury. The patients had car accident (2 pts.), motorcycle accident (1), train accident (1) and compression injury (1). All of them had complete posterior urethral disruption and temporary suprapubic catheter. All patients underwent delayed repair that include excision of obliterated urethral segment and primary anastomosis. The average delay from the injury to the time of repair was 10 (6-13) months. Mean length of the injury was 3.5 cm (ranged 2–5.5 cm). Four of the patients had crural separation in order to achieve tension free anastomosis. No-one had inferior pubectomy or rerouting of the urethra.

RESULTS
The patients were followed for 6 to 84 months (mean 45 months). All patients reported good quality of urinary stream. Average Q max was 16.2 (±4.5), and there was no need for additional surgical procedure. One patient had recurrent urinary tract infections and one reported moderate erectile dysfunction. There was no patients who reported permanent urinary incontinence.

CONCLUSION
PFUI is a rare surgical condition in childhood. This small series of patients confirmed that successful treatment can be achieved with delayed repair that include excision of obliterated segment and tension-free anastomosis of the urethra.

PW12UR10: PHIMOSIS IN HEMATOPOETIC STEM CELL TRANSPLANTATIONS: IS IT A MANIFESTATION OF GRAFT-VERSUS-HOST-DISEASE?

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AIM OF THE STUDY
graft-versus-host-disease (GVHD) is a common and serious complication of hematopoietic stem cell transplantations (HSCT) that can also involve urogenital tract. Genital chronic GVHD in female adults is note while few reports are focused to males especially in pediatric patients. We studied HSCT pediatric recipients of our Institution to analyze the genital GVHD involvement in male children and eventual risk factors.

METHODS
From January 2010 to October 2018, we performed 384 circumcisions. In the same period, we collected 320 HSCT pediatric recipients, 190 male, with all data regarding oncohematological diagnosis, conditioning regimen, prophylaxis for GVHD, presence and grade of acute GVHD (before 100 days from HSCT) and chronic GVHD (after 100 days from HSTC), presence of phimosis and necessity of surgical or medical treatment. Histological samples were analyzed when foreskin was available.

MAIN RESULTS
In 8 years, 14 (7.4%) of 190 HSCT recipients boys presented phimosis. More than 50% of these children had manifested acute GVHD and/or chronic GVHD. In 9 cases circumcisions was necessary, while in the remaining 5 local steroids therapy was efficacious. In 1 of 5 histological samples focal sclerodermatous signs of chronic GVHD were also present.

CONCLUSIONS
Phimosis should be considered an important clinical characteristic of GVHD in male submitted to HSCT. In case of inefficacious steroids therapy, circumcision is mandatory.

PW12UR11: MULTIDISCIPLINARY GENITAL RECONSTRUCTIVE SURGERY FOR SECONDARY VAGINAL STENOSES IN YOUNG ADULTS – BIDIRECTIONAL TRANSITION FROM PEDIATRIC SURGERY TO GYNECOLOGY AND BACK

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INTRODUCTION
Secondary vaginal stenosis may occur after genital reconstruction of genital malformation in childhood or after failed vaginal aplasia repair in adults. Herein we report the results of the surgical treatment of these patients in a multidisciplinary team of pediatric surgeons and gynecologists.

METHODS
Data of adolescent and adult patients treated between 2015 and 2017 were analyzed retrospectively: underlying type of malformation, the number and surgical techniques of former vaginoplasties, technique of revision of the stenotic vagina, possibility of sexual intercourse, temporary vaginal dilatation, and cosmesis.

RESULTS
14 patients were referred for therapy after reconstructive genital surgery elsewhere. Median age at referral was 21 years (range 14-31). Nine patients originally had urogenital sinus (CAH, 6; mixed gonadal dysgenesis, 1; anal atresia with overlooked sinus, 2), two patients had Mayer-Rokitanski-Küster Hauser syndrome, and one each had cloaca, cloacal exstrophy, vaginal atresia. Median number of prior genital surgery was 4 (range 1-7) .Prior surgery was urogenital mobilization (7) posterior sagittal anorectovaginourethroplasty (1), bowel vaginoplasty (1), Vecchietti vaginoplasty (2), posterior sagittal anorectoplasty (2). We performed revision of the stenotic vagina with partial urogenital mobilization and posterior skin flap (9), vaginal pull-through (2), sigma vaginoplasty (2), modified McIndoe (1). 13/14 patients performed temporary vaginal dilatation, after 12 months all but one patient presented with physiological vaginas, the latter still needs regular dilations.

CONCLUSION
Severe vaginal stenosis is a late complication of female genital malformations presented to gynecologists. Optimal treatment should consist in a multidisciplinary treatment and often requires operative techniques of pediatric surgery.

PW12UR12: IS EFFICACY OF TRANSCUTANEOUS ELECTRIC NERVE STIMULATION (TENS) TREATMENT FOR OVERACTIVE BLADDER IN CHILDREN INFLUENCED BY BMI AND STIMULATION FREQUENCY?

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INTRODUCTION/AIM
Subcutaneous fat can attenuate electrical impulses and the degree of attenuation increases with frequency. We hypothesized the efficacy of TENS therapy decreases with increases in BMI and stimulation frequency and aimed to assess it.

MATERIAL AND METHODS
We evaluated outcomes of patients treated with TENS for overactive bladder. We collected demographic data including BMI and TENS programme setting (80 Hz and 10 Hz). A successful treatment response was defined as “significant improvement” by parent and child.

RESULTS
325 patients (median age=9 years, 197 female) were analysed (see table)

		Response		
		No improvement	Improvement	Total
BMI	High	26	33	59
	Low-Normal	116	150	266
	Total	142	183	325

The overall success rates for patients with BMI>=25 and BMI<25 were 55% and 56% respectively (Chi-sq test, p=0.513).The response rates appear much more consistent in the high BMI group with a near 50% at both frequencies.

In the low-normal BMI group, there is a 33% more likelihood of no improvement at high frequency and 22% more likelihood of improvement at low frequencies.

CONCLUSIONS
Our results suggest, in children with high BMI, stimulation frequency does not appear to affect response. However, in children with low-normal BMIs, where perhaps the stimulation pulses reach their target, TENS at 10 Hz appears more effective than at 80 Hz. The finding is consistent with animal studies that have demonstrated stimulating at 10 Hz elicited inhibition of the overactive contraction by activating of the external urinary sphincter (Boggs et al. J Physiol 577.1 (2006) pp 115–126).

PW13TH01: LUNG FUNCTION IN INFANTS WITH ESOPHAGEAL ATRESIA AT 6-MONTH FOLLOW-UP

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INTRODUCTION
Patients affected by esophageal atresia (EA) often faced airway problems, mainly liked to persistent tracheomalacia. Aim of present study was to evaluate lung function test (LFT) in those infants comparing with published healthy control at 6-month follow-up.

METHODS
Retrospective evaluation of lung function in infants treated for EA (2010-2017) was performed. Results obtained were compared with published reference value for healthy control. Tidal volume (Vt), respiratory rate (RR), time to peak tidal expiratory flow as a percentage of total expiratory time (tPTEF/te), were analyzed. T-test was used as appropriate.

RESULTS
During the study period 172 patients were treated for EA. Of those 48 infants (28%) underwent LFT at 6-month of corrected age. Tracheomalacia was present in 20 infants (42%). Vt significantly differs from published healthy control (6.67 (+/- 2.09) vs 9.7 (+/- 1.3); p 0.0001), as well as RR (50 (+/- 15.6) vs 31.5 (+/- 7.7); p 0.0001). Conversely tPTEF/te did not significantly differs from control (0.25 (+/-0.12) vs 0.27 (+/- 0.09); p 0.19).

CONCLUSION
Our preliminary data suggest that EA patients experience impaired lung function at 6-month of age, although the presence of selection bias and retrospective nature of the study. Evaluation of lung function is warranted in EA infants to early detect respiratory symptoms, ideally reducing the impact on short- and long-term pulmonary outcomes.

PW13TH02: SEVERE LARYNGOTRACHEAL STENOSIS: IS RESECTION ANASTOMOSIS A GOOD OPTION URING LEARNING CURVE?

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AIM OF THE STUDY
Severe laryngotracheal stenosis require open repair. Benign stenoses are often treated with an expansion surgery (laryngotracheal reconstruction, LTR) with anterior and/or posterior cartilage graft. The resection of the stenotic segment is more radical (partial cricotracheal resection, PCTR, or tracheal resection, TR), and in severe cases (stenosis >70%) give more chance of decannulation than LTR, according to the literature. However, PCTR/TR is seldom performed in pediatric centers, due to the technical difficulty, long learning curve and potential surgical complications. The aim is to present the initial experience of PCTR/TR in a single pediatric Center.

METHODS
Multidisciplinary Airway Team treated 20 consecutive airway resections: 13 PCTR and 7 TR, in patients from 7 months to 13 years of age and weighting from 3 and 60 Kg, 15 with previous tracheostomy. The vast majority presented postintubation stenosis grade III or IV, 10 of them underwent a previous endoscopic or open procedure.

MAIN RESULTS
In 50% of patients tracheostomy was initially maintained after PCTR/TR. Two dehicences was observed in patients with medical unknown predisposing factor, another patient died for brain hemorrage after surgery. No laryngeal nerve paralysis were observed. Final decannulation was achieved in 11 patients (55%), 4 others (20%) are on decannulation protocol, 1 is on endoscopic treatment, 2 will require redo surgery, 1 is still tracheostomy dependant due to distal malacia.

CONCLUSION
Even during learning curve, PCTR/RT was an effective treatment for severe airway stenosis in Centers with a multidisciplinary Airway Team

PW13TH04: MAGNETIC RESONANCE IMAGING (MRI) VERSUS COMPUTED TOMOGRAFY (CT) IN CONGENITAL LUNG MALFORMATION (CLM): LOOKING FOR THE BEST PRE-OPERATIVE ASSESSMENT

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AIM OF THE STUDY
To analyze the role of MRI in the diagnosis of CLM,comparing the results to CT scans and histologic findings.

METHODS
We reviewed the data of patients with prenatal diagnosis of CLM born from July 2013 to February 2018 at our Center. Every patient underwent a “feed and wrap” MRI at birth. If CLM was confirmed, a pre-operative CT scan was planned between the 4th and 5th months of life. Qualitative and quantitative variables were reviewed on both imaging scans. Thoracoscopic resection was performed within 8th months of age and histological results were compared to imaging. Quantitative data was analyzed with t Student test and qualitative data with Cohen’s kappa test.

MAIN RESULTS
20 patients (10 males) were included in the study. No statistical difference was found on maximum diameter of the lesion (MRI: 27.6mm vs CT 29.55mm; p=0.22). Kappa’s concordance test showed excellent agreement between MRI and CT on evidencing air cysts, liquid cysts, bronchocele and bronchial atresia; substantial agreement on arterial vessels and overinflating areas; moderate agreement on venous vessels. Sensibility in diagnosing pulmonary sequestration was 71% for both MRI and CT. Sensibility was not calculated for other malformations due to the low number of patients.

CONCLUSION
MRI and CT scan show similar ability in describing and diagnosing CLM. CT scan remains the preferred pre-operative imaging technique for its better parenchymal and spatial resolution, but neonatal MRI is helpful in giving early accurate information for both surgeons and parents, without adding radiation exposure.

PW13TH05: RISK FACTORS FOR RECURRENCE AFTER CONGENITAL DIAPHRAGMATIC HERNIA REPAIR

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AIM OF THE STUDY
Congenital diaphragmatic hernia (CDH) carries a high morbidity and mortality rate. Recurrence is a treatment-related morbidity which can be preventable. Our aim is to identify factors that increase the reherniation risk.

METHODS
Retrospective review of medical records of CDH patients treated between 2013 and 2017 in our center. Demographic, clinical and surgical variables were collected. Multiple logistic regression analysis was performed to identify which factors increase the risk of recurrence.

MAIN RESULTS
Out of 68 patients with CDH, 51 survived the neonatal period and were included. Mean birth weight was 2900 g, 94% of the patients had a left CDH, mean lung-to-head ratio observed/expected (LHR o/e) was 32.5%. 17 patients underwent a primary closure, in 26 a Gore-tex® patch was used and in 8 a biological patch (porcine dermis) was used. Eight patients needed ECMO. Seven patients presented recurrence. Mean follow-up time was 3.6 years. Multiple logistic regression analysis revealed that the use of a biological patch (75% vs 2.3%, OR 126; 95% CI: 9.9 to 1611; $p<0.001$) and the need for ECMO (37.5% vs 5.9%, OR 5.9; 95% CI: 1.004 to 34.1; $p=0.05$) increased the risk of recurrence. Birth weight, gender, laterality, LHR o/e and fetal tracheal occlusion were not related with a higher risk of recurrence.

CONCLUSIONS
The main risk factor for CDH recurrence in our series is the use of a biological patch. We do not recommend the use of porcine dermis patches for CDH repair.

PW13TH06: PROTOCOLARY X-RAY AFTER A THORACIC DRAIN REMOVAL MAY NOT BE INDICATED

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AIM
After the removal of a thoracic drain, chest X-ray is performed routinely. However, most of them do not show any complication that entails a change in therapeutic management. The aim of this study is to assess whether this radiographs would be dispensable.

METHODS
Retrospective and unicentric descriptive study of pediatric patients treated in our center, who had a thoracic drain placed as treatment for empyema or after pulmonary resection (between 2012 and 2019). Changes observed in the x-ray before and after its removal were evaluated. The following variables were collected: radiological diagnosis, patient's clinic, treatment and outcomes.

MAIN RESULTS
A total of 128 chest drains removed in 125 patients (64 men and 61 women) mean age 4.55 +/- 4.035 were analyzed. Of these, 87 had been placed as treatment for an empyema and 41 after a pulmonary resection. The drain was maintained 5.21 +/- 3.176 days. 93.8% of radiographys after removal showed no signs of complications. 7 (5.5%) cases presented a small pneumothorax and 1 (0.8%) subcutaneous emphysema. Among these 8 patients, none had associated symptoms and all of them were managed conservatively.

CONCLUSIONS
We believe that control rx-rays after drain removal should be performed only in case of symptomatic patients or when an incidence during removal occurs.

PW13TH07: LEFT CARDIAC SYMPATHETIC DENERVATION AS ADJUVANT TREATMENT FOR LIFE-THREATENING CONGENITAL VENTRICULAR TACHYARRHYTHMIAS

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AIM OF THE STUDY
To review our experience in left cardiac sympathetic denervation (LCSD) to treat life-threatening congenital ventricular tachyarrhythmias.

METHODS
A retrospective review of patients who underwent LCSD for life-threatening congenital ventricular tachyarrhythmias between 2010 and 2018 was performed. Demographic data, underlying disease, clinical and electrocardiographic results, complications and follow-up time were reviewed.

MAIN RESULTS
28 patients were identified, 54% females. Mean age at surgery: 11 years (8 days - 21 years). 75% had long QT syndrome (LQTS) and 25% catecholaminergic polymorphic ventricular tachycardia. All patients were previously on β-blockers treatment. Indications for surgery were: symptoms or ventricular tachycardia (VT) in 18 patients and high risk for malignant arrhythmias in 10. Thoracoscopic LCSD from first to fifth thoracic ganglia was performed in all patients (subcutaneous Holter placement was associated in 7).

Medical treatment was maintained in all patients. 23 out of 28 patients are continuously monitored with implantable cardioverter defibrillator (ICD) or subcutaneous Holter.

With a mean follow-up of 29 months, 85% of the patients remain asymptomatic and 15% presented symptoms (3 had syncope and 1 an ICD discharge). VT was recorded in 7 patients (3 due to pharmacologic noncompliance). One patient (LQTS type 7) had no improvement on electrocardiogram.

Five minor complications were registered: 3 transient Horner's syndrome and 2 patients with scapular hyperesthesia. No mortality was found.

CONCLUSIONS
LCSD is a safe and effective treatment for pediatric patients with life-threatening congenital ventricular tachyarrhythmias, not only as secondary prevention, but also as an adjuvant treatment in asymptomatic patients.

PW13TH08: ASSOCIATED CONGENITAL TRACHEAL STENOSES. CORRECTION WITH USE OF CARDIOPULMONARY BYPASS

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AIM OF THE STUDY
Congenital complete ring tracheal stenosis is a severe and potentially lethal malformation, especially in association with abnormalities of heart, great vessels and lungs. The aim was to optimize surgical correction of congenital tracheal stenosis using cardio-pulmonary bypass (CPB).

METHODS
Chest CT and tracheobronchoscopy were used to confirm intrathoracic tracheal stenosis. Surgery was performed under CPB and consisted of segmental tracheal resection (n=3) including reconstruction of tracheal bifurcation (n=2), slide tracheoplasty (n=2), balloon tracheal dilation and stenting (n=1) along with simultaneous closure of ventricular septal defect (VSD) (n=2) and left pulmonary artery reimplantation as a component of vascular ring repair (n=4).

MAIN RESULTS
Six patients aged 8 to 20 (13.0±1.9) months were included to study. The length of stenosis varied from 0.8 to 4.0 cm (2.3±0.5 cm) that was 13.3-83% (44.0±11.2%) of tracheal length. The grade of tracheal narrowing ranged from 60 to 80% (66.7±2.8%). Two patients had bridging bronchus stenosis, another 2 had long segment stenosis. Associated malformations were following: pulmonary artery sling (n=4), VSD (n=2), right lung agenesis (n=1), aberrant right subclavian artery (n=2) and duodenal atresia and cloacal form of anorectal malformation (n=1). Four (67%) patients survived simultaneous surgical correction and have good result for 0.5-8 years. Two (33%) patients died within early postoperative period because of acute respiratory distress.

CONCLUSIONS
Congenital stenoses of intrathoracic trachea have severe course and is often associated with cardiac, great vessels and pulmonary malformations. Surgical correction is possible with simultaneous operations with the use of cardiopulmonary bypass.

PW13TH09: FACTORS RELATED TO FAILURE TO THRIVE IN CONGENITAL DIAPHRAGMATIC HERNIA PATIENTS DURING HOSPITAL STAY

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AIM

After stabilization and surgery, patients with congenital diaphragmatic hernia (CDH) often are hospitalized for a long period for further growth and development. This study provides insight in some possible factors related to normal growth and failure to thrive in the postoperative period when patients are transferred from NICU to the surgical ward.

METHODS

All surviving and surgically treated patients with CDH from 2014-2017 that primarily stayed at the NICU (last nine days is period 1) and had a minimum stay of nine days at the pediatric ward (period 2), were included in this retrospective analysis. A third period was studied in patients who were admitted for an extra nine days at the pediatric ward (period 3). Vital functions, food- and oxygen suppletion and weight changes were compared.

RESULTS

Nineteen patients were included for the first two periods and eighteen for three. There were significant differences in vital functions between the periods (Table). Eight patients had growth restriction after discontinuing oxygen suppletion. After suppletion was restarted in seven patients, six of them regained weight. Another eight patients lost weight due to expansion of oral feeding while seven regained weight after restarting nasogastric tube feeding.

CONCLUSION

There was a trend in increase in failure to thrive after early expansion of oral feeding and ceasing oxygen suppletion, which corrected after starting oxygen suppletion and nasogastric tube feeding in most patients. We recommend to wean CDH patients slowly from oxygen suppletion and reduce physical strain as much as possible to ensure proper growth.

Variables, mean (SD)	Period 1 (n=19)	Period 2 (n=19)	Period 3 (n=18)	P-value period 1 versus period 2 (n=19)	P-value period 1 versus period 3 (n=18)	P-value period 2 versus period 3 (n=18)
Growth (grams/day)	12 (39)	13 (40)	30 (13)	0.96	0.14	0.06
Heart rate (/min)	152 (11)	147 (16)	139 (14)	0.22	**0.002**	**0.001**
Respiratory frequency (/min)	58 (10)	54 (10)	54 (10)	0.096	**0.01**	**0.04**
Oxygen saturation (%)	97 (1)	99 (1)	99 (1)	**<0.001**	**<0.001**	**0.05**
Temperature (Celsius)	37.2 (0.2)	37.1 (0.1)	37.1 (0.15)	**0.02**	0.07	0.51

PW13TH10: RISK FACTORS FOR THE DEVELOPMENT OF SCOLIOSIS AFTER CHEST WALL RESECTIONS FOR MALIGNANT TUMORS IN CHILDREN

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AIM OF STUDY
To identify and describe the risk factors associated with scoliosis following a rib or chest wall resection.

METHODS
Retrospective review of patients who underwent a resection of a malignant tumor of the chest wall in a single pediatric institution between 2008-2018. Demographic, clinical and diagnostic data were recorded as well as information regarding treatment given to each patient. Changes in curvature were measured based on radiograph or CT during follow-up period. Scoliosis was defined by Cobb´s angle > 10º.

MAIN RESULTS
Fourteen patients, mean age at surgical thoracic resection 12,6 yo [7,1-17,8], were included. Most of them were males (9/13) and Ewing sarcoma family tumor was the most frequent underlying disease (8/13) followed by costal metastasis.

The median number of ribs resected was 2 [1-4].Gore-Tex reconstruction was performed in 5/14 patients, 4/14 associated a resorbable fixation system to Gore-Tex and in 5/14 no reconstruction was needed.

Seven patients (50%) developed scoliosis with a mean Cobb´s angle of 21,71º [15-28] that was related to the number of ribs resected ($p<0,05$). Four patients developed a convex towards the resection, while 3/7 developed a convex away from the surgical site.

All patients with resections between T4-T8 developed scoliosis no matter how many ribs were resected or thoracic reconstruction needed ($p<0,001$).

Mean follow-up period was 24 months.

CONCLUSIONS
Patients undergoing rib or chest wall resection are at risk for developing scoliosis, particularly if the resection is performed between forth and eight rib or when the it involves three or more ribs.

PW13TH11: RARE CASES OF AWN ASPIRATION CAUSING BRONCHOPLEURAL FISTULA AND BRONCHIECTASIS

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AIM
Aspiration of grass inflorescences into the tracheobronchial tree is an uncommon event and difficult to diagnose because of its unspecific symptoms. After initial signs such as coughing, wheezing or vomiting symptoms disappear and bronchoscopy is usually negative. This phenomenon is due to the special shape of grass heads, which helps migration towards periphery of the lung. After a symptomless interval serious, life-threatening complications such as tension pneumothorax, empyema, bronchopleurocutaneous fistula may develop.

CASES
We present two cases of pleuropneumonia resulting from awn aspiration. In Case 1 initial bronchoscopy was negative, but 6 months later computed tomography (CT) showed bronchiectasis. During repeated bronchoscopy small pieces of awn were removed from the bronchial tree. After another 3 months with recurring pneumonia, lobectomy was needed because of the foreign body-related serious damage of the right lower lobe. In Case 2 after a negative bronchoscopy, CT showed signs of localized pleuropneumonia with pulmonary abscess in the right lower lobe. One month after inhalation thoracotomy and segmentectomy with excision of the bronchopleural fistula and awn was performed.

CONCLUSION
If there is clear anamnesis of inhaled awn regular diagnostic imaging (chest ultrasound, X-ray) should be performed even if there is a negative bronchoscopy, or inflammatory markers improve. On suspicion of any signs of inflammation chest CT can be useful in revealing and identifying the position of grass head. The majority of cases with negative bronchoscopy finally need surgical removal, which should be managed before developing serious complications.

PW13TH12: COMPLICATIONS AFTER MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM (MIRPE) IN A SINGLE PEDIATRIC THIRD-LEVEL CENTER

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BACKGROUND AND AIMS

Pectus excavatum is usually repaired through minimally invasive approach (MIRPE) with placement of one or more retrosternal bars remaining in situ for 3 years. Surgical complications have been described, some severe, including intraoperative heart/lung perforation, bar dislocation. and others. Our aim is to evaluate the total complication rate after MIRPE in a single pediatric center.

METHODS

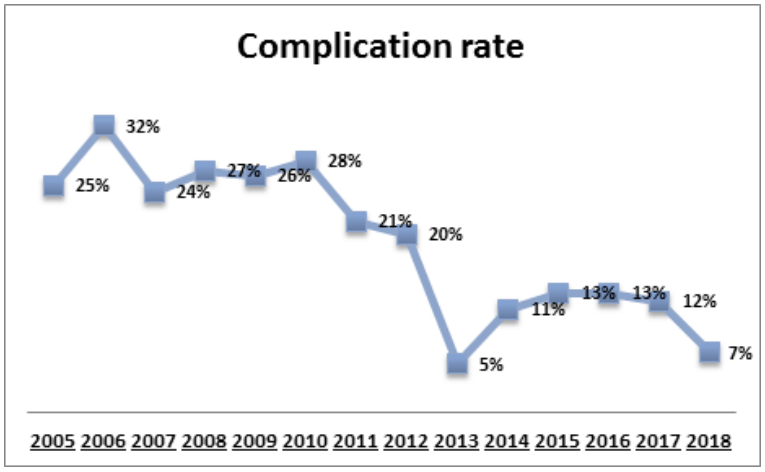
A retrospective study was conducted on 520 consecutive patients (M:F=436:84) who underwent MIRPE, operated from June 2005 to December 2018 by the same surgeons. In 57% the bar was removed. For each patient, we evaluated morphologic PE classification, Haller index, operative time, number and type of bars, bar stabilizers and length of hospital stay. We evaluated all the complications and we observed their rate through the years in order to detect the effect of the learning curve.

MAIN RESULTS

Median Haller index was 4.6, mean operative time was 83 minutes. The bar most used were Biomet (394 patients) and Intrauma (123). We did not observe any cardiac perforation nor mortality. Ninety-two complications occurred (17.7%): 26 intraoperative and 66 postoperative. In 4% reoperation was necessary. The complication rate decreased during the years (Figure 1). No significative differences were detected according to the bar type. The most common postoperative complications were wound infection (2,3%) and bar dislocation (4,4%). The most common intraoperative complication was pericardic opening (2%, never reported in the last 7 years).

CONCLUSIONS

MIRPE is a safe procedure in a dedicated environment and complications are correlated to the surgeon's experience.



PW14GE01: REGENERATIVE SURGERY IN PEDIATRIC PATIENT: FATGRAFT AS TREATMENT FOR SCAR

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AIM OF THE STUDY
To understand whether fat graft (FG) procedure could be used in the current surgical techniques as treatment for atrophic, hypertrophic and retracted scar due to burns and trauma on pediatric patients.

METHODS
From January 2014 to September 2018, an institutional retrospective study was performed evaluating patients treated for pathologic scars.

Patients included in our study reported hypertrophic, atrophic and retracted scars.

From age 5 to 19 years old (med. 12.2 y), 201 patients were evaluated, treated with conservative rehabilitative therapy; 21 from them (9 Males, 12 Females) were not responded to conservative therapy and get treated with FG procedure, which permits through mesenchymal cells from adipose tissue to restore scar tissue and its elasticity.

The procedure was made according to the recommendations of Coleman on harvesting; processing, cleaning fat tissue aspirate in sterilization system and transfer it to target scar area.

Results performed using POSAS Patient and Observer Scar Assessment Scale comparing pre and post-surgery score with Wilcoxon Test.

MAIN RESULTS
No complication was reported. Follow up period was: 3 to 36 months. Results show a statistical significance (*p-value*< 0.05) that has been obtained for all analyzed data after FG with an improvement of POSAS score (OSAS 39.48 to 25.67; PSAS 36, 24 to 20,43).

CONCLUSION
We consider FG as a new tool on the treatment of all pathological scars in pediatric patients. It improves scar tissue and transforms its aspect with an excellent regenerative effect. It ‘s simple, low risk, mini invasive and effective.

PW14GE02: INTRODUCING ROBOLAP SURGERY. A NOVEL HYBRID OF ROBOTIC AND LAPAROSCOPIC SURGERY IN CHILDREN

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AIM

To overcome the extreme difficulty encountered when suturing small, 5mm or less, diameter anastomoses during conventional laparoscopic (CL) surgery in children, we used a hybrid of da Vinci® (dV) and CL, we call robolap surgery, to treat choledochal cyst (CC) and pelvic ureteric junction stenosis (PUJS) in children for the first time.

CC: Robolap was used for treating 7 cases. dV Xi was used for the hepaticojejunostomy anastomosis (HJA) and CL for everything else such as CC dissection and creating the roux-loop. Ages at robolap ranged from 1-11 years old, HJA was 5mm or less in 3 cases.HJA proceeded smoothly using 6/0 PDS (9.3mm needle) interrupted sutures, with precision greatly enhanced by dV. HJA quality was identical to open hepaticojejunostomy. Recovery was uneventful; patients were ambulant between days 2-4 postoperatively, and drain removal/discharge between days 7-10. All are well without sequelae after mean follow-up of 12.1 months.

PUJS: Robolap was used to treat an 8 and 10-year-old with PUJS retroperitoneoscopically. Again, the pelvi-ureteric anastomosis was performed using dV Xi, resulting in good quality anastomoses identical to open surgery. The postoperative course was uneventful and both are well after removing double J stents.

Conclusions: dV is not suitable for dissecting organs in children because of space constraints and a limited range of energy devices, while anastomoses can be difficult with CL (Table 1). Robolap allows surgery to be performed optimally by using the best available technique for each procedure.

Table 1: Pros and cons of da Vinci versus conventional laparoscopy

	dV	CL
Anastomosis:	**Suitable and feasible**	**Unsuitable**
Dissecting organs:	**Not suitable**	**Suitable**

dV: da Vinci surgical system, CL: conventional laparoscopy,

PW14GE03: TIMING AND TYPE OF GASTROSCHISIS DELIVERY: ELECTIVE PRETERM DELIVERY AND VAGINAL LABOUR AMELIORATE THE OUTCOME

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AIM OF THE STUDY
Timing and type of gastroschisis delivery is a controversial topic. This study investigates whether there is a reason to support elective preterm delivery and vaginal labour.

METHODS
A retrospective (2004-2013) and prospective (2014-2018) single center study was performed.
We compared the defined outcome measures of elective preterm delivery group G1 (controlled labour onset gestational age [GA] of 35+6 to 36+6) with the control group G2 (uncontrolled labour onset GA of 35+6 to 36+6) and group G3 (GA of 37+0 and more). The following outcomes were analyzed: first enteral feeding (FF), length of total parenteral nutrition (TPN), ventilator days (VD), sepsis and necrotising enterocolitis (NEC). The impact of delivery type (vaginal labour vs caesarean section) on outcome was studied, furthermore the occurrence of bowel complications (perforation or strangulation) after vaginal delivery was observed. The Mann-Whitney test and Student's T test were used for statistical analysis.

MAIN RESULTS
85 neonates were included in the study. G1 found fewer days to FF ($p<0.05$) in comparison with G2 and G3. There was no difference in the number of ventilator days, TPN, sepsis or development of NEC in the groups. The type of delivery does not influence the outcome ($p<0.001$), vaginal labour does not bring bowel complications ($p<0.001$).

CONCLUSIONS
Elective preterm delivery of a fetus with gastroschisis ameliorates intestinal injury with respect to earlier enteral feeding ($p<0.05$). Delivery type does not influence the outcome ($p<0.001$), vaginal labour does not bring bowel complications ($p<0.001$).

PW14GE04: TAKE HOME LAPAROSCOPY SIMULATORS IN PEDIATRIC SURGERY: IS MORE EXPENSIVE BETTER?

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AIM
Many procedures in pediatric surgery are relatively uncommon, but require difficult minimally invasive skills (MIS). To increase MIS skills, it is important to be able to train outside the clinical setting. Therefore, training at home could be the solution. We compared two affordable pediatric MIS simulators, which are easily transported and set up with a tablet or laptop.

METHOD
The Laparoscopyboxx (€99.95 excluding 3mm instruments) is a portable simulator, which is shipped as a self-assembly kit. It has no tracking possibilities. The EoSim simulator (€778,-, 3mm instruments sold seperately) is a small suitcase, with a build-in camera and tracking option.

During several conferences (January 2017-December 2018), participants were asked to use both simulators and complete questionnaires regarding their opinion on realism and didactic value, on a 5-point Likert scale.

RESULTS
Fifty participants completed at least one questionnaire on their opinion regarding the simulators. Of these 44 completed the questions on the LaparoscopyBoxx and 32 on the EoSim simulator. The participants consisted of 16 experts (>50 pediatric laparoscopic procedures performed) and 34 target participants, consisting of residents/ fellows.

Both simulators scored well on the questionnaire (Table). However, the LaparoscopyBoxx scored significantly higher regarding the ‘on screen representation of the instrument actions’ (means 4.2 versus 3.5, p=0.001), ‘training tool for pediatric surgery’ (means 4.3 versus 3.9, p=0.017) and ‘appealing take home simulator’ (means 4.6 versus 4.0, p=0.002).

CONCLUSION
Both take home simulators scored well in this study, although the EoSim has tracking capabilities, the LaparoscopyBoxx scored significantly better and costs less.

PW14GE05: NEURODEVELOPMENTAL OUTCOMES OF PATIENTS WITH GASTROINTESTINAL CONGENITAL MALFORMATIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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INTRODUCTION
Patients with gastrointestinal congenital malformations may be at risk of neurodevelopmental impairment, due to multiple factors, such as exposure to anesthetics, perioperative hemodynamics or post-operative immuno-inflammatory dynamics.

METHODS
Pubmed, Embase and Web of Science were searched for peer-reviewed articles published until January 2018. Search terms were related to the malformations of interest, cognitive, motor and language outcomes and infancy and childhood. Studies reporting cognitive, motor and language outcomes of patients with gastrointestinal malformations in infancy and childhood were included. Standardized mean differences (Cohen's d) in cognitive, motor and language outcomes between patients with gastrointestinal congenital malformations and controls or normative population scores were aggregated across studies using random-effects meta-analysis. The value of (clinical) predictors to explain heterogeneity in effect sizes was studied using meta-regression and subgroups based on age and diagnosis were compared.

RESULTS
The 40 included studies represented a total of 1839 patients. Patients with gastrointestinal congenital malformations had small-sized overall neurodevelopmental impairment (d=-0.421, p<0.001; 95%CI -0.525 to -0.316), which was explained by small-sized cognitive impairment (d=-0.393, p<0.001; 95%CI -0.506 to -0.281), small- to medium-sized motor impairment (d=-0.483, p<0.001; 95%CI -0.628 to -0.338) and medium-sized language impairment (d=-0.597 p<0.001; 95%CI -0.893 to -0.302). Effects were not moderated by gestational age and birthweight. Cognitive impairment slightly decreased with age (r=0.004; p=0.03). Patients with short bowel syndrome had poorer overall neurodevelopmental outcomes compared to other subgroups (Q=35.29; p<0.001).

CONCLUSIONS
This systematic review and meta-analysis shows that patients with gastrointestinal congenital malformations exhibit small- to medium-sized impairments in neurodevelopmental outcomes.

PW14GE06: SUBUMBILICAL VS. TRANSUMBILICAL LAPAROSCOPIC ASSISTED APPENDECTOMY: A PATIENTS' SATISFACTION-CENTERED EVALUATION

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AIM OF THE STUDY
Studies suggest that trans-umbilical incisions (TUI) incur better postoperative cosmetic satisfaction scores (CSS) than sub-umbilical incisions (SUI) but a higher incidence of surgical site infection (SSI). We aimed to compare SSI and CSS in pediatric patient treated with TUI or SUI for uncomplicated appendicitis (UA).

METHODS
We analyzed the medical records of 92 children (60 M, 32 F) treated at our Institution from April 2017 to December 2018 for UA with TUI or SUI. The parents of patients were invited to a telephonic interview on post-operative course, filling in also the "patient subscale of the Patient and Observer Surgical Assessment Scale (POSAS)". T-test for continuous data and Fisher's test for categorical variables were used for statistical analysis, when appropriate (Graphpad 5.0 software, $p<0.05$ significant)

MAIN RESULTS
Of 92 patients, 64 agreed to participate to the study (12 SUI and 52 TUI). The groups were similar in terms of age, sex, BMI, histology of the appendix, incidence of granuloma. Postoperative hospitalization was significantly longer in SUI group. A tendency versus a higher rate of surgical site infection was noted for SUI and a lower POSAS for TUI, although statistically insignificant. A positive overall opinion in both groups was reported (Table).

CONCLUSIONS
From the patient's perspective and considering surgical outcomes, TUI seems to be preferable over SUI as approach for UA, but larger prospective series are needed.

	TUI (n=52)	SUI (n=12)	p-value
Age (years, mean +/- SD)	10 +/- 3	9 +/- 4	0,52
Sex (M:F)	37:15	10:2	0,49
BMI (kg/m²)	19,4 +/- 5,1	18,5 +/- 2,8	0,60
Gangrenous appendix (n)	8	2	1
Lenght of stay (days)	3,3 +/- 1,1	4 +/- 1,8	0,05
Surgical site infection (n)	1	2	0,08
Granuloma (n)	2	0	1
POSAS score	11,3 +/- 7,6	14,2 +/- 9,2	0,25
Overall opinion	2,1 +/- 1,9	2,5 +/- 2	0,7

PW14GE07: OMPHALOCELE: CURRENT BIRTH INCIDENCE AND SURVIVAL RATES

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AIM OF THE STUDY

Improvements in prenatal ultrasound screening has lead to increasing rates of in prenatal diagnosis of Omphalocele. This, together the fact that the rate if associated anomalies in Omphalocele are high, leads to increasung rates of termination of pregnancies. The aim of this study was to examine the national Swedish birth incident and the mortality among these patients.

METHODS

This is a nationwide, population-based cohort study containing all children born in Sweden between 1/1 1997 to 31/12 2016. The cases were identified in the Swedish National Patient Register and data on diagnosis and mortality were collected from the Swedish National Patient Register, the Swedish Medical Birth Register and the Swedish Causes of Death Register.

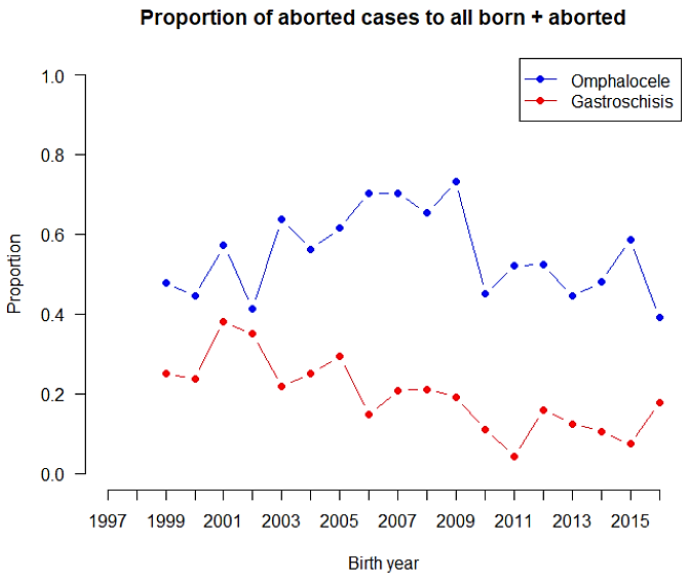
MAIN RESULTS

The study included 222 cases of Omphalocele during the 20 year study period. The rate of termination of pregnancy (TOP) was 55% (Figure 1). The birth prevalence for Omphalocele was 0,55/5000 births, 43% were males. The 1-year mortality rate was 13,3% among the born cases.

CONCLUSION

The study shows a current birth incidence for Omphalocele of 1/10000 newborn, with high termination rates, over half of the prenatally diagnosed Omphalocele will opt for TOP. Among those who continue the pregnancy, 1-year survival rates are high.

Figure 1: Proportion of TOP



PW14GE08: TRAINING THE COMPONENT STEPS OF AN ECMO CANULATION OUTSIDE THE CLINICAL SETTING

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RadboudUMC, Nijmegen, Netherlands

AIM

When an ExtraCorporeal Membrane Oxygenation (ECMO) canulation is needed, this is mainly a stressful procedure, because the patient is hemodynamic instable. Although the dissection of the vessels is not considered complex, the insertion and fixation of the cannulas should be performed following the protocol, to ensure a successful cannulation. Problems or delay in successful cannulation can result in the decease of a patient. Therefore it is important to have the opportunity to train this outside the clinical setting.

METHODS

A relatively low budget, easy to use model was developed and evaluated by experienced pediatric surgeons and residents/ fellows, who were training for the procedure (target group). They all completed a questionnaire regarding their experience and opinion on the ECMO model on general aspects and for the training of the component steps. All items were graded on a 5-point Likert scale.

RESULTS

Twenty-one participants completed the questionnaire, including fourteen experts. The haptics of the landscape scored least, with a mean of 3.6, although the haptics of the vessels scored highest with 4.0. The component steps tested on the model are shown in the Table, with the scoring of the total groups (means 3.8-4.0) and separate expertise groups. Only step 2 'opening of the vessels' was scored significantly different between the expertise levels (means Experts: 4.0, Target group: 3.4, p=0.032).

CONCLUSION

This low budget model is considered a valid tool to train the component steps of the ECMO cannulation, which could avoid this learning curve in the stressful clinical setting.

Opinion on ECMO model	Total group N=21	Target group n=7	Experienced group n=14	p-value
Visual aspects	3.8 (0.54)	3.9 (0.38)	3.7 (0.61)	0.519
Haptics of the landscape	3.6 (0.75)	3.7 (0.95)	3.5 (0.65)	0.605
Haptics of the vessels	4.0 (0.63)	4.0 (0.58)	4.0 (0.68)	1.000
Step 1: Control of the vessels	3.8 (0.60)	3.9 (0.69)	3.8 (0.58)	0.818
Step 2: Opening of the vessels	3.8 (0.51)	3.4 (0.54)	4.0 (0.40)	**0.032**
Step 3: Placement of the canulas	4.0 (0.78)	4.0 (0.58)	4.0 (0.88)	1.000
Step 4: Fixation of the canulas	4.0 (0.59)	4.0 (0.82)	3.9 (0.48)	0.836
Step 5: Connection of canulas	3.8 (0.62)	3.5 (0.55)	4.0 (0.60)	0.105

The grading of the items is based on a 5-point Likert scale (1: very bad, 3: neutral, 5: very good). Significant differences were calculated with the independent t-test.

PW14GE09: COST-EFFECTIVENESS ANALYSIS IN THE TREATMENT OF ONYCHOCRYPTOSIS IN CHILDREN

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AIM OF THE STUDY
Electrocautery for matricectomy in partial onychectomy has been the treatment of choice at our centre for stage II-III onychocryptosis. It is a major outpatient surgical procedure, which generates significant direct costs (preoperative assessment, operating room time and day hospital stay). Our aim was to compare the effectiveness and costs of such procedure with an alternative treatment: partial onychectomy and chemical matricectomy with silver nitrate performed at the outpatient clinic with local anesthesia.

METHODS
A cost-effectiveness analysis was performed between 2016-2018 on patients with stage II-III onychocryptosis, comparing those who underwent major outpatient surgery (protocol A) and those who were treated at the outpatient clinic (protocol B). Effectiveness was assessed through recurrence and postoperative infection rates. Direct costs were calculated according to the national health service official public price list (2017).

MAIN RESULTS
Eighty-one patients (56 protocol A and 25 protocol B) who underwent 154 partial onychectomies (106 protocol A and 48 protocol B) were included. When compared to protocol A, protocol B showed a lower rate of recurrence (5.8%A vs 2.1%B) and postoperative infection (1.8%A vs 0%B), without showing statistically significant differences. Procedure costs for protocol A were 1091€ per patient and 593.2€ per onychectomy, both significantly higher than for protocol B (260€ per patient and 135.4€ per onychectomy; p<0,001).

CONCLUSIONS
Partial onychectomy performed at the outpatient clinic is a cost-effective and cost-efficient alternative in the treatment of onychocryptosis in children, with a cost reduction of up to 831€ per patient and 457.7€ per procedure.

PW14GE10: HANDHELD METAL-DETECTOR VERSUS CHEST-ABDOMINAL PLAIN RADIOGRAPHY IN CHILDREN WITH SUSPECTED METALLIC FOREIGN BODY INGESTION: DO WE CAN SAFELY ABANDON X-RAY?

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INTRODUCTION
Ingestion of metallic foreign bodies (MFBs) is a frequent occurrence in children and is commonly diagnosed via X-Ray imaging.

In recent years, the handheld metal detector (HMD) has been increasingly adopted by several paediatric hospitals as it is considered an effective and accurate diagnostic tool that avoids exposure to ionizing radiations. Sensitivity of HMD has been reported high (99.4%) in case of coin ingestion, but significantly lower (46%) when considering the ingestion of other types of MFBs.

AIM OF THE STUDY
We tested the effectiveness of the HMD in diagnosing ingested MFBs in children less than 14 years of age, in our Paediatric Emergency Department (PED).

MATERIALS AND METHODS
We prospectively evaluated all cases of MFBs ingestion that presented at the PED of our hospital from March 2015 to July 2017.

We selected cases in which both metal detector scan (Bosch DMF 10 zoom professional model) and X-Ray results were available.

RESULTS
98 patients were included.

The overall sensitivity was 63.2% (79.5% for coins, 25.5% for batteries and 56% for other objects) while the specificity was 95%.

The HMD could have replaced the X-Ray examination only if a MFB was detected below the xyphoid process.

CONCLUSIONS
Based on our findings, a negative result of HMD is not sufficient to exclude an ingestion of MFBs. Therefore, in case of an evocative history and depending on type and size of the foreign body, a radiological investigation is still necessary.

PW14GE11: TOO LARGE TO CLOSE, NO NEED FOR SCHUSTER'S: GRAVITATIONAL AUTOREPOSITION SUTURES FOR STAGED CLOSURE OF OMPHALOCELES

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AIM
Management strategies for large omphaloceles remain controversial. We present GRAVITAS (**Gravit**ational **A**utoreposition **S**utures), the method used at our institution when successful primary closure is deemed questionable. Patient's primary clinical course and long-term outcomes were analyzed.

METHODS
Single-center retrospective analysis of all consecutive patients with omphaloceles treated between 1997 and 2018. Decision for GRAVITAS was made when the defect was estimated too large for primary closure. Traction sutures were placed in the surrounding fascia and suspended from the top of the incubator to allow gravitational autoreposition of the herniated organs. Ventilation and muscle relaxation were maintained until secondary closure, which was performed after the viscera had been reduced by repeated adjustment of the suture's tension. Data are presented as mean ±SD.

RESULTS
12 of 49 patients with omphaloceles were treated with GRAVITAS (n=33 primary closure, n=4 Schuster`s technique). In 9 patients with isolated omphalocele, secondary closure was achieved after 4±2 days. Ventilation time was 5±2 days; time to full feeds 18±16 days. In 3 patients (n=2 Cantrell's Pentalogy, n=1 Fallot's tetralogy), abdominal closure was achieved after 8±2 days. Due to cardiorespiratory comorbidity, ventilation time was >30 d. No intestinal morbidity occurred during follow-up (30±35 months). Five patients received initial closure of the skin and secondary fascial closure after 18±15 months. One patient with prior fascial closure underwent later repair of an abdominal-wall hernia.

CONCLUSIONS
GRAVITAS is a feasible method for staged closure of large omphaloceles when successful primary closure is deemed questionable.

PW14GE12: PERINATAL IMAGING AND CLINICAL OUTCOMES IN NEONATES WITH A CERVICAL LYMPHATIC MALFORMATION

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AIM OF THE STUDY

Cervical lymphatic malformations (LMs) are rare congenital anomalies which can be life-threatening in case of airway obstruction. If diagnosed prenatally, ex-utero intrapartum therapy (EXIT) can be performed to secure the fetal airway under placental support. This study aims to evaluate perinatal imaging and clinical outcomes in neonates with a cervical LM.

METHODS

A retrospective study was conducted of neonates with clinical or radiological suspicion of potential airway obstruction caused by an LM and treated at a tertiary referral center between 2011 and 2018. Reviewed data included imaging records, mode of delivery, LM subtype and extent, treatment and clinical outcomes.

MAIN RESULTS

Table 1 shows the perinatal imaging findings and clinical information regarding the study population (n=10). Among the patients who were born through EXIT, one died after five days because of sepsis. All patients underwent sclerotherapy, sometimes combined with cyst drainage (n=3) or debulking (n=2). Treatment started on average at day 30 after birth (median, range 0-148). Three patients showed a good clinical response, one patient is still on regular treatment and five patients started treatment with sirolimus because of respiratory compromise due to LM swelling despite sclerotherapy.

CONCLUSION

In most neonates, the LM was diagnosed prenatally. Although clinical outcomes varied widely, more than half of the patients needed a tracheostomy or intubation. Therefore, it is important to be aware that neonates with a cervical LM are susceptible to respiratory compromise due to LM swelling, whether or not provoked by infection or sclerotherapy, requiring early treatment.

Table 1: perinatal imaging findings and clinical information

	Patients (n=10)
Prenatal imaging (ultrasound / MRI)	
- Tracheal deviation	2
- Invasion into pharynx or oral cavity	1
- Abnormal position of the spine/head/tongue	5
- Lymphatic malformation not diagnosed	2
Postnatal imaging (MRI; n=8)	
- Involvement sublingual space	6
- Involvement parapharyngeal space	8
- Involvement thoracal space	3
- Intralesional bleeding component	6
Lymphatic malformation subtype	
- Macrocystic	2
- Microcystic	1
- Mixed	7
Clinical information	
- EXIT	4
- Gestational age at birth (median, range)	38.0 (31.3-39.6)
- Birth weight (median, range)	3275 (2130-4180)
- Tracheostomy	3
- Prolonged intubation after birth	3
- Infectious episode(s)	8

PW15GE01: SURGICAL TREATMENT FOR COMPLICATED APPENDICITIS: OPEN OR LAPAROSCOPIC SURGERY?

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AIM OF STUDY

Open appendectomy (OS) has been considered the gold-standard treatment for acute appendicitis. However, it has currently been questioned due to the development of laparoscopic surgery (LS), which allows a minimally invasive approach. Yet, despite the advantages of LS, there is still reticence to use it in complicated appendicitis (CA). Our aim is to analyze the differences between open and LS for CA.

METHODS

We carried out a retrospective study of children who underwent surgery for complicated appendicitis (gangrenous, peritonitis or plastron) at our center between 2017-2018. We differentiated two groups: OS or LS. We analyzed demographic and clinical variables, length of hospital stay, surgery time, complications and hospitalization costs.

MAIN RESULTS

Two hundred and thirty patients were included, 175 for OS and 55 for LS. We observed a significant increase by 14.9% in the use of LS in our hospital last year (p=0.002), with only 2,2% conversions to open approach. The mean surgery time for LS was higher than OS (46.5±17.7vs.69.7±24.4 minutes; p<0.001), without significant differences in the rate of intra-abdominal abscess (10.9% vs. 20.0%; p=0.106), wound infection (6.3%vs.14.0%;p=0.087), wound dehiscence (4.0%vs.9.1%;p=0.164) or bowel obstruction (2.3%vs0.0%;p=0.575), for OS and LS, respectively. LS significantly reduced length of hospital stay, with mean of 5.7±3.4 days vs. 6.3±3.1 days for OS (p=0.039). LS allowed a cost reduction of 910€ per patient.

CONCLUSIONS

LS is a safe and cost-effective approach for the treatment of CA. In comparison to OS, LS reduces length of hospital stay, without increasing postoperative complications.

	Global	Open surgery (n=175)	Laparoscopic surgery (n=55)	*p*
	Mean	*Mean*	*Mean*	
Age (years)	9.06 ±3.57	8.49 ± 3.64	10.87 ± 2.70	p<0.001
BIM (kg/m²)	18.20 ± 3.17	17.28 ± 2.70	20.32 ± 3.18	p<0.001
Length of hospital stay (days)	6.12 ± 3.17	6.26 ± 3.08	5.67 ± 3.43	p<0.039
Postoperative day of intra-abdominal abscess (days)	5.41 ± 3.25	6.21± 3.31	4.23 ± 2.89	p=0.021
Surgery time (minutes)	52.05 ± 21.86	46.45 ± 17.70	69.69 ± 24.36	p<0.001

	Global		Open surgery (n=175)		Laparoscopic surgery (n=55)		*p*
	n	*%*	*n*	*%*	*n*	*%*	
Appendectomy (approach)	230	100	175	76.1	55	23.9	-
Gender (n=230)							
Male	137	59.6	102	58.3	35	63.6	*p=0.53*
Female	93	40.4	73	41.7	20	36.4	
Dignosis (n=230)							
Gangrenous	150	65.2	105	60	45	81.8	p=0.06
Peritonitis	69	30.0	62	35.4	7	12.7	
Appendicular plastron	11	4.8	8	4.6	3	5.5	
Complications (n=230)							
Intra-abdominal abscess	30	13.0	19	10.9	11	20.0	*p=0.106*
Wound infection	19	8.3	11	6.3	8	14.5	*p=0.087*
Wound dehiscence	12	5.2	7	4.0	5	9.1	*p=0.164*
Bowel obstruction	4	1.7	4	2.3	0	0.0	*p=0.575*

PW15GE02: DOES SEDATION FOR SURGICAL PROCEDURES IN THE EMERGENCY ROOM REPRESENT A REAL BENEFIT?

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AIM OF THE STUDY
Implementation of sedations in the Emergency Room (ER), performed by pediatricians' specifically trained, enables realization of surgical procedures outside the Operating Room (OR). This fact increases healthcare quality given that it accelerates treatment of patients, allows painless techniques, as well as diminishes costs derived from OR activity and hospital admissions. Our objective was to evaluate the procedures more frequently done in the ER, safety of the sedations and the resulting economical savings.

METHODS
We retrospectively reviewed patients sedated in the ER during the years 2017 and 2018. We only included those attended by Pediatric Surgeons, and extracted data regarding the type of procedure, medication used for sedation, adverse effects and hospital stay.

MAIN RESULTS
From 604 sedations performed, 116 were Pediatric Surgery cases. 58 patients underwent burn debridement, 32 patients needed wound suture, abscess incision and drainage was done in 11 cases and other procedures in 15 patients. Ketamina + midazolam iv. were the drugs most frequently used for the sedation (46%). All procedures lasted less than 60 minutes. No serious complications occurred. 84% of patients were discharged in less than 13 hours, and only 11 patients had to be admitted to continue treatment. Not using the OR entailed 65.540 € of savings, and avoiding admissions saved 89.992 € to the public health system. This meant a total of 77.766 € saved per year.

CONCLUSIONS
Performing sedations in the ER is safe for short surgical procedures, increases healthcare quality and considerably diminishes costs of assistance.

PW15GE03: CURRENT OPINIONS AND PRACTICES OF BARIATRIC SURGERY IN ADOLESCENTS: A SURVEY AMONG EUPSA MEMBERS

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AIM
In adolescents with severe obesity not responding to conservative treatment, bariatric surgery is performed at increasing rate. In the USA this treatment is generally accepted, yet in Europe surgeons are more reluctant because of concerns regarding safety and (long-term) efficacy. We evaluated in which European countries bariatric surgery is allowed, performed, and how EUPSA members feel about bariatric surgery in adolescents.

METHODS
Invitations for an online questionnaire were sent to all EUPSA members.

RESULTS
119 paediatric surgeons (PSs) from 34 countries (of which 25 European) completed the survey, mean working experience was 19 ± 12 years. Sixty-nine PSs (58%) from 22 countries stated that bariatric surgery in youngsters was allowed in their country, although only 11% PSs worked in clinics where this type of surgery is being performed. The costs were (partially) covered by healthcare insurances in only 14 countries. Overall, 61% (n=73) believed bariatric surgery may offer a valuable contribution to obtain substantial long-term weight loss in severely obese adolescents. Fifty-one (43%) felt that these procedures should be performed by a combination of a bariatric and a paediatric surgeon, while 20 (17%) and 17 (14%) preferred that these procedures should be performed solely by a paediatric or bariatric surgeon respectively.

CONCLUSIONS
Although allowed in most European countries, bariatric surgery in adolescents is only practiced on a small scale, and patients are often excluded from regular healthcare reimbursement. The majority of PSs acknowledge the value of bariatric surgery, which should be performed by a combination of paediatric and bariatric surgeons.

PW15GE04: PIRS TECHNIQUE FOR THE TREATMENT OF INGUINAL HERNIAS IN BOYS

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AIM OF THE STUDY

Minimally invasive surgery is increasingly applicable in the pediatric patients. We present our initial experience in the use of PIRS (percutaneous inguinal repair suture) technique for the treatment of inguinal hernias in boys.

METHODS

Retrospective review of boys with diagnosis of inguinal hernia, operated according to PIRS technique between January 2017 - December 2018. PIRS technique was performed under direct vision with 5mm-0º pleuroscope with 3 mm working channel. A 3mm dissector was used through the working channel. A 20 G epidural needle, monofilament polypropylene suture and braided polyester suture were used in all cases. In the case of contralateral patent peritoneovaginal duct, it was repaired by PIRS in the same surgical act.

MAIN RESULTS

104 PIRS were performed in 68 children in outpatient basis. Mean age was 3 years old. 32 cases were unilateral and 36 bilateral. In 15 patiens the preoperative diagnosis was unilateral, nevertheless cotralateral defect side was diagnosed and treated in the same surgical act. Mean operative time was 15 minutes and 27 minutes in unilateral and bilateral cases respectively. At the beginning of our learning curve, we had 1 early recidive in a premature infant that was reoperated through PIRS succesfully, 2 cases of vascular injury, resolved with compression measures. The follow-up was 1-20 months.

CONCLUSIONS

PIRS technique avoids the manipulation of the spermatic cord elements and allows intraoperative diagnosis and repair of contralateral defects. PIRS technique has a fast learning curve and good functional and aesthetic results, without visible scars.

PW15GE05: EFFICACY OF TRANSVERSUS ABDOMINIS PLANE (TAP) VERSUS RECTUS SHEATH (RS) BLOCKS IN LAPAROSCOPIC PYLOROMYOTOMY

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AIM OF THE STUDY
Ultrasound (US) guided Transversus abdominis plane (TAP) and Rectus sheath (RS) blocks are well described techniques of analgesia for abdominal surgery. There is a paucity of data regarding their use in laparoscopic pyloromyotomy.We examined the analgesic efficacy of TAP vs RS block.

METHODS
Retrospective casenote review of all patients undergoing laparoscopic pyloromyotomy (February 2011-June 2016). Parameters examined: age, weight, type of block, intra-operative heart rate and blood pressure, rescue analgesia and post-operative analgesia. Data are presented as median with range in parentheses.

MAIN RESULTS
Anaesthetic chart comparison of 23 RS vs 9 TAP blocks during 2013. Three cases had both blocks and were excluded. Age and weight were comparable between the two groups. In TAP group no patients required intraoperative rescue analgesia vs 5 patients in RS (21.7%) who received opiates (p=0.15). Change in intraoperative heart rate from baseline to peak was 3 (0-23) % in the TAP group vs 1 (0-29) % in the RS group (p=0.9). Intraoperative systolic blood pressure change from baseline to peak was 8 (0-18) % in the TAP group and 0 (6-31) % in the RS group (p=0.9). Total postoperative Paracetamol requirement was 27.2 (0-150) mg/kg in TAP, and 19.5 (0-61.1) mg/kg in RS (p=0.9). One patient in the RS group received Ibuprofen, and no patients received postoperative Morphine.

CONCLUSIONS
TAP block appears to provide adequate intra- and postoperative analgesia to infants undergoing laparoscopic pyloromyotomy, and is comparable to RS block.

PW15GE06: DIAGNOSTIC LYMPH NODE BIOPSY - ARE WE MISSING TUBERCULOSIS?

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AIM OF THE STUDY
In an age of widespread immigration and long-distance travel, diseases are no longer confined to geographical areas. Although tuberculosis (TB) is an unfamiliar diagnosis in Western European paediatric surgical practice, TB prevalence in London is 25 per 100,000, higher than in Mexico. Lymphadenopathy is a common presentation for extra-pulmonary TB. There is a significant risk of missing TB if diagnostic lymph node biopsy (DLNB) samples are inappropriately processed. We evaluate the current management of children referred for DLNB in diagnosing TB.

METHODS
Review of case notes for all children undergoing DLNB in two London paediatric surgical centres June 2015 - December 2017. Data were collected on pre-operative risk stratification for TB disease, how DLNB samples are sent and final diagnosis.

MAIN RESULTS
Twenty-two patients referred from seven specialties underwent DLNB performed by three clinical teams (paediatric surgery, otorhinolaryngology and interventional radiology). Nine (41%) had documented risk stratification for TB pre-operatively. Pus from necrotic nodes was found in two patients intra-operatively, neither was highlighted as potential TB lymphadenitis. All six nodes (27%) sent fresh for TB culture were negative. Two patients were diagnosed with TB, neither had been stratified as high risk: one had positive TB culture from node sent fresh for histology, the other had microscopy positive Acid-Fast Bacilli in a formalin sample.

CONCLUSION Current management for DLNB is erratic, posing a significant risk of missing TB. A standardised clinical pathway, including pre-operative risk stratification is required to optimise care for children referred for DLNB.

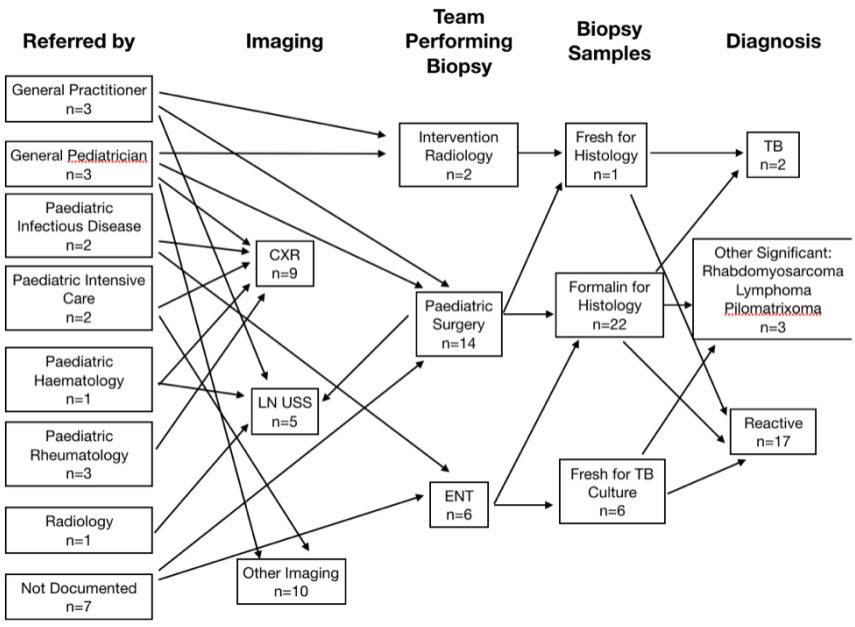

Figure.1 Current Management for DLNB.

PW15GE07: THE IMPACT OF MECHANICAL BOWEL PREPARATION PRIOR TO ELECTIVE OSTOMY CLOSURE SURGERY

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AIM OF THE STUDY
Mechanical bowel preparation prior to elective ostomy closure surgery is a common practice in children to reduce the risk of surgical complications.
Given the controversy existing in current literature, our objective is to determine its effectiveness in our hospital

METHODS
We performed a retrospective study of 62 patients over 4 kg undergoing bowel transit reconstruction in the last 13 years in our center.
Group MBP (N=30 patients) underwent standard mechanical bowel preparation with polyethylene glycol and clear fluids during the 24 hours previous surgery. Group No-MBP (N=32 patients) received no bowel preparation and was on normal diet preoperatively. The groups were homogeneous in age, weight, previous pathology and ostomy segment (ileum/colon). Surgical technique was similar in both groups. The following variables were collected: percentage of wound infection, dehiscence, intra-abdominal abscess, intestinal obstruction, and hydro-electrolytic alterations (hyponatremia, hypokalemia), and the length of time until passing stool, starting fluids intake, and hospital discharge (days).
Chi-square and t-student for independent variables were used.

MAIN RESULTS
There were no significant differences between the two groups in any of the surgical complications or postoperative periods studied (all $p>0.05$). There was significant difference in hydro-electrolytic complications (hyponatremia) ($p=0.02$) being more frequent in the MBP group.

CONCLUSIONS
In our series, mechanical bowel preparation prior to surgery does not reduce the risk of surgical complications, although it may produce hydro-electrolytic alterations.

PW15GE08: A CHALLENGING TYPE OF INGUINAL HERNIA IN INFANTS: GIANT HERNIA

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AIM OF THE STUDY
Giant inguinoscrotal hernias are relatively rare in childhood. In this study, giant inguinoscrotal hernias were defined and the rate of recurrence was investigated in patients operated with two different techniques.

METHODS
The patients with giant inguinoscrotal hernia between May 2015 and January 2018 were evaluated retrospectively.

MAIN RESULTS
Giant inguinoscrotal hernia was detected in 64 (4%) of 1548 male patients with inguinal hernia. The median age was 9 months (6 months-4 years). Diagnostic criteria defined as scrotum is filled with bowel in physical examination, the bowels herniate again quickly after reduction and the inner ring diameter is 2 centimeters above in ultrasonography. None of the patients had incarceration. 29 (45%) patients underwent high ligation hernioplasty, 35 (55%) zig hernioplasty. Internal inguinal ring was narrowed in all patients. Postoperative wound site infection was seen in 2 patients who done high ligation and one with zig hernioplasty. Prolonged scrotal edema was observed in all patients for one month postoperatively. Recurrence was observed in 6 (20.6%) of 29 patients who were operated with high ligation and 2 (5.7%) of other 35 patients. The mean follow-up period was 20 months (2 months-3 years). There has been no iatrogenic undescended testis or testicular atrophy.

CONCLUSIONS
Giant hernias should be considered as a separate group from classical inguinoscrotal hernias. Zig maneuver hernioplasty provides possibility to protect the wall integrity of sac by giving a more accurate dissection to cord and vein structures. Recurrence may be reduced in giant hernias with this technique.

PW15GE09: VENOUS MALFORMATIONS IN PAEDIATRIC AGE: MULTIDISCIPLINARY APPROACH AND THERAPEUTIC OUTCOMES

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AIMS OF THE STUDY
To analyse the different outcomes in patients with venous malformations (VMs) who underwent standard treatments (surgery, sclerotherapy).

METHODS
An institutional retrospectivestudy on patients suffering from VMs over the last three years was conducted. Details related to pre and post treatment clinical sign and symptoms, lesion characteristics, were extracted from patients' records. Pain was evaluated by Wong-Baker FACES Pain Rating scale. We have compared post-treatment outcomes dividing patients into Group 1 (palliative treatment: sclerotherapy and not radical surgery) and Group 2 (radical surgery). Epi Info software for statistical analysis, Fisher test and Mann-Whitney/Wilcoxon test for variables.$P < 0,05$ was considered significant.

RESULTS
Eighty-two VMs were found (median age 9,67 years, min 0,67- max 23,42).42 patients were treated. Groups 1 and 2 were composed respectively by 27 patients (64%) and 15 patients (36%). Both groups (1 – 2) presented improvement after treatment of: tumefaction and ecchymosis ($p= 0,03 – p <0,01$), phleboliths ($p=0,01$ - $p=0,04$), coagulation parameters ($p=0,01$ - $p=0,04$). Group 2 presented statistically significant improvement of functional restrictions ($p<0,01$) and pain ($p=0,01$), with 33,3% (n=5) of recurrence in the observational period.

CONCLUSIONS
This study confirmed that surgery seems to be an essential treatment for selected population of VMs. Target therapies may be a therapeutic option in future, especially in patients with large non resectable complex VMs, but further studies are advisable to support this new approach

PW15GE10: MULTIFOCAL CAPILLARY MALFORMATION WITH CENTRAL ATROPHY. A CASE SERIES STUDY

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AIM OF THE STUDY
Capillary malformations (CM) can be eventually the hallmark of associated anomalies and their pattern must be recognized by neonatologists and pediatric surgeons in order to accurately counseling. Sturge-Weber, Cobb or CLAPO syndromes among others are good examples of such condition.

METHODS
We describe a series of cases of patients followed in our institution between 2008 and 2018, which present CM with unique characteristics representing a non-previously recognized pattern and deserving future investigation.

MAIN RESULTS
We reviewed 8 patients (5 women and 3 men), with a new CM phenotype characterized by the presence of CM, being present from birth, with multifocal and segmental distribution, bright red color, well-defined margins and an area of central atrophy or macular atrophy. The most frequently affected location was the gluteal region (3 patients). The histological characteristics of all of them were similar with unique findings. None of the patients presented vascular or skeletal malformations associated. Genetic studies in order to confirm GNAQ or GNA11 mutation will be soon available.

CONCLUSIONS
We present a new CM phenotype not previously described and not provisionally classifiable. We have denominated it multifocal capillary malformations with central atrophy in order to differentiate it from the geographical CM, which are usually associated with other vascular malformations and, therefore, with greater morbidity. The genetic study of possible mutations in the molecular pathways involved in these vascular malformations will help us to deepen their pathogenesis.

PW15GE11: A NOVEL METHOD IN PREOPERATIVE DIAGNOSIS OF ACUTE APPENDICITIS IN CHILDREN

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AIM OF STUDY
There is a tendency toward the nonoperative management which results in an increasing need for preoperative diagnosis and classification of appendicitis. For medical decision-making purposes conceptual simple decision-making models that can learn, are widely used. Decision trees are reliable and effective techniques which provide high classification accuracy. We aim to test if we can detect appendicitis patients and differentiate noncomplicated appendicitis from complicated.

METHODS
After approval of IRB#2017/2549, all cases admitted between 2010 and 2016 were grouped as Group 1 healthy control, Group 2 sham control, Group 3 sham disease and Group 4 disease which also analyzed under four groups as false laparotomy, noncomplicated, complicated without abscess and complicated with abscess. Patients who had comorbidities and whose CBC or pathology results were lack, excluded from the study. Data was collected by demographics, preoperative blood analysis, and postoperative diagnosis. Various machine learning algorithms applied to detect appendicitis patients. Most of the algorithms, especially linear methods, provided similar performance measures. We have preferred decision tree model due to its easier interpretability.

MAIN RESULTS
There were 7244 patients with a mean age of 6.84±5.31 years, of which 82.3% (5960/7244) were male. We detect the appendicitis patients with 95.45% accuracy, 97.87 % area under the curve (AUC), 97.63% sensitivity and 94.11% specificity, and noncomplicated appendicitis with 70.83% accuracy, 79.47% AUC, 66.81% sensitivity and 81.88% specificity (Figure 1).

CONCLUSION
Machine learning is a novel approach to prevent unnecessary operations and decrease the burden of appendicitis both on patients and health systems.

PW16BS01: THE USE OF THREE DIMENSIONAL PRINTED MODELS IN PEDIATRIC SURGERY STUDENT EDUCATION: FIRST IMPRESSIONS AND PROCESS

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AIM
The aim of this study to present the process of the manufacturing three-dimensional (3d) printed educational models and our experiences related to using these models in Pediatric Surgery student education.

METHODS
Five main disease groups related to pediatric surgery (esophageal atresia, anorectal malformations, vesicoureteric reflux, choledochal cysts, intestinal atresias) were designed by a 3d program on the computer. After the printing, post-production processes were made on models which printed by the 3d printer. These models were used on the fifth-class medical students' theoretical and practical lessons in the 3 groups in 2018. Feedbacks were taken with the post-internship surveys in this semester.

RESULTS
All models' design and print processings which planned were completed. The survey feedbacks showed the students who were in the groups which these models were used in the theoretical and practical lessons were satisfied. There was no negative feedback.

CONCLUSION
Pediatric Surgery-specific diseases models were produced with the 3d printer within this study. Not only printed materials but also augmented reality and blended education are getting the possible in the medical education owing to the 3d design. The survey results indicated that these models have positive effects on the "students' education" in pediatric surgery.

PW16BS02: DETRUSOR SMOOTH MUSCLE CELL REACTION TO PARASYMPATHETIC ACTIVATION AND ELECTROSTIMULATION

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BACKGROUND
In the post-surgery medical rehabilitation of children with various severecongenital defects (e.g.the urinary bladder exstrophy–totalepispadias, UBETE), the electrical stimulation of operated excitable tissues is an important constituent.

METHODS
We have developed a biologically inspired biophysical model of a smooth muscle cell (SMC) of the urinary bladder detrusor, which was stimulated according to different protocols, some of which were similar to standard rehabilitation ones.

RESULTS
The metabotropic and ionotropic components of the SMC parasympathetic activation were simulated by increase in the conductivity of channels of Ca^{2+} dependent Cl-current and P2X channels, respectively (in 10:1 proportion characteristic of the prototype). The model SMC generated action potentials (APs) in response to both suprathreshold depolarizing current and combined metabotropic/ionotropic action. The SMC excitability decreased at decreased M2/M3 expression characteristic of UBETE. Such a deficiency of excitability could be compensated by lowering the threshold for electrical excitation when conductivity of P2X channels was increased that mimicked the effect of purinomimetics. For instance, the threshold intensity of the stimulating current decreased by 35% when applied on the background of 25%-increase in the conductivity of P2X channels.Such a lowering of APs threshold under conditions of higher conductivity of P2X channels conducting inward depolarizing current draws attention to the possibility of functionally equivalent rehabilitation electrostimulation with a reduced (and therefore, probably less discomfortable) intensity of electrical impulses on the background of premedication with purinomimetics.

CONCLUSION
These results can become a basis for improvement of the rehabilitation electrical stimulation, in particular by combining with purinomimetic premedication.

PW16BS03: INDUCED COLONIC ISCHEMIA IN RATS

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AIM OF THE STUDY
To study the effect of chronic ischemia on the colon in rats

METHODS
Ischemia of the descending colon through ligation of the arterial branches was induced in 10 outbred rats. Bowel revision and colonic biopsy was performed in different terms (of 9 to 62 days). The distribution of enteric nervous ganglions (ENG) was assessed using H&E staining. Wilcoxon test, Spearman's correlation test were used ($p<0.05$ were considered statistically significant).

MAIN RESULTS
9(90%) animals had bowel dysfunction (7 -softened stool, 1-diarrhea, 1-fecal impaction). On 2nd laparotomy ischemic colonic segment (ICS) was narrow in 2 rats (20%). 5 (50%) rats had ICS without feces; 8(80%) had dilatation of the right colon upper the ICS (strong correlation between these two parameters). Colonic fecal stasis in the upper segment (5/50%) had strong correlation with empty ICS. We did not detected correlation between the duration of the experiment and degree of the intestinal dilatation. Aganglionosis of the ICS detected in 1 rat (10%). The number of ENG in the ICS in another animals ranged from 10.5 to 18.5 per 5 mm (Me 11.25). The number of ING in the right colon in rat with aganglionosis was 8.5 per 5 mm, in another animals - from 13 to 27 per 5 mm (Me 19). The differences between this two parameters are statistically significant.

CONCLUSIONS
All rats after surgery had bowel dysfunction. 80% rats had intestinal obstruction on 2nd laparotomy. The number of ENS was significantly lower in ICS than in normal colon.

PW16BS04: ULTRASTRUCTURE OF MESENTERIAL LYMPHATIC NODES AND SPLEEN IN RATS WITH EXTRAHEPATIC PORTAL HYPERTENSION AFTER TREATMENT WITH VOBENZYM AND POLYOXYDONIUM

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AIM OF THE STUDY
The lack of the data on morphological and functional changes in the organs of immune system such as mesenteric lymphatic nodes and spleen involved in the pathological process under extrahepatic portal hypertension (EPH) as well as absence of the theoretical base on preventing immunological complications has pushed us to perform an experimental model on laboratory animals. The aim of the study was to investigate the ultrastructural changes in the mesenteric lymphatic nodes and spleen in rats with EPH and after treatment with vobenzym and polyoxidonium.

METHODS
The object of electron microscopic investigation and gas chromatography was tissue of the spleen and mesenteric lymphatic nodes of 20 juvenile rats which were divided into two groups: first group (10 rats) to whom in the age of two months EPH was modeled surgically, second group (10 rats) with EPH who for one month was treated with vobenzym and polyoxidonium.

MAIN RESULTS
It was determined that proposed schema of the treatment helps to achieve better preservation of ultrastructure of mesenteric lymphatic nodes and spleen in 90% of laboratory animals. It have permitted to stop degenerative processes caused by the invasion of intestinal bacteria, by activating the process of phagocytosis, antibody stimulation, increasing resistance of membranes to cytotoxic agents, inhibition of lipid oxidation. Furthermore processes of circulating immune complexes and proliferation of immune cells were normalized if compared to untreated animals.

CONCLUSIONS
Positive changes give reason to believe that such combined scheme is an appropriate immune therapy under extrahepatic portal hypertension.

PW16BS05: USE OF AUGMENTED REALITY IN PEDIATRIC SURGERY AND PEDIATRIC UROLOGY EDUCATION: FIRST STEPS

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AIM
To share the first experiences of the process related to the use of 3D disease models created by computer software using Augmented reality for the Pediatric Surgery and Pediatric Urology education.

MATERIAL AND METHOD
Within the scope of the project "Use of disease models produced by three-dimensional printer for the Pediatric Surgery education," conducted by Cerrahpaşa Medical Faculty Pediatric Surgery Department, congenital disease models for educational purposes, produced using 3D softwares on computer were transformed into augmented reality models on mobile platforms (tablet-phone). Model drawings were made by our team using 3DsMAX software. Augmented reality images were obtained by Unity and Vuforia software.

DISCUSSION
The project of production of augmented reality supported educational models is continuing in our department. First examples are presented in this study.

PW16BS06: SYSTEM APPROACH TO DIAGNOSTICS AND TREATMENT OF BONE AND JOINT SEPSIS IN INFANTS

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AIM OF THE STUDY
Osteoarticular sepsis causes 2–6% mortality and 18–20% population complications. In accordance with the peculiarities of its morphogenesis, early diagnosis and treatment is the basis for the recovery of patients.

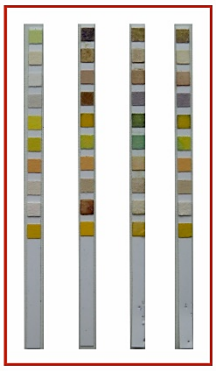
METHODS
To verify the pathology of bone and joint sepsis as a manifestation of sepsis (Sepsis 3) on the first day after admission to the hospital, we conduct research on: macrophages (monocytes, preseptin); indicators of coagulation hemostasis; proinflammatory proteins (procalcitonin, CRP), etiological factors (PSR of bacteria, fungi and viruses) - in the whole organism, as well as local changes - such as dysfunctions of the bone and joint apparatus - in the form of excess leukocytes (cytology in the lesion) and their qualitative changes - (EI-test). At the same time, ultrasound examinations are performed. X-ray is made within only 10-14 days from the onset of the disease.

RESULTS
10 years of experience with a systematic approach to the treatment of hematogenous osteomyelitis and septic arthritis in infants eliminated mortality and reduced the number of orthopedic complications by up to 10%. The medical complex included systemic a / b therapy, correction of coagulation and hemodynamic disturbances, local sanitation of the inflammatory focus under the control of cytological studies and in the last 3 years - leukocyte esterase.

CONCLUSION
The results of treatment of bone and joint sepsis in infants are closely related to the time of onset of treatment from the onset of the disease and the adequacy of the choice of antibiotics.

Diagnosis of septic osteoarthritis is carried out according to the definition of the LE-test (Biomerie), which replaced the cytological study. Correlation between the values of the CRP and the parameters of the LE-test is established.

Tests:	Number of paticnts	Value of LE (leu/ul)(%):		
		O (negative)	10-25 (few)	75-500 (positive)
LE-test	38	21,0	58,0	21,0
CRP (12 mcg/ml)		8	77.3	0
		7,5		
CRP (48 mcg/ml)		0	23.5	62.5



Dynamics of changes in leukocyte elastase in the treatment of septic arthritis

PW16BS07: BRACHIAL VEIN: A USEFUL RESCUE OPTION FOR AUTOLOGOUS ARTERIOVENOUS FISTULA IN CHILDREN WITH END STAGE RENAL DISEASE

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AIM OF THE STUDY

In children requiring autologous arteriovenous fistula (AVF) for chronic hemodialysis (HD), lack of upper extremity veins represents a challenging problem. In adults, the use of deep brachial vein (BV) is a rescue useful alternative. We report our experience with autologous AVF using BV in pediatric patients.

METHODS

Medical records of patients affected by end-stage renal disease who underwent AVF for HD from 2013 to 2018 at our hospital were reviewed to determine treatment outcomes. All AVF were created with side to end arteriovenous anastomosis by microsurgical technique.

RESULTS

Seventeen patients underwent 22 AVF. Mean age was 14,1 years (range 4-25) and mean weigth was 47,1 Kg (range 22-82). Three children (1 posterior urethral valve, 1 Wilm's tumor in Becwith-Wiedemann syndrome and 1 polycystic kidney, 17%) required 4 BV anastomosis (mean age 8,6 years and mean weight 28 Kg), because of loss of forearm vessels. Median follow up was 28 months (range 2- 62). Functional maturation was achieved in 82% of AVF (100 % using BV) and mean time since puncture was 50 days (range 35-78; 45 days using BV). Mean primary patency time was 12 months. Superficialization was mandatory in four patients (3 BV) from 1 to 6 months after primary AVF. We observed 11 complications, 5 requiring redo AVF (4 non-BV and 1 BV).

CONCLUSION

BV could be a useful and effective alternative for upper extremity autologous vascular access for HD in children who do not have adequate native superficial venous conduit.

PW16BS08: PEDIATRIC THYROID GLAND SURGERY: CAUSES AND RESULTS IN A TERTIARY CENTER

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AIM OF THE STUDY
Surgical intervention of the thyroid gland is an uncommon procedure with a recent increased frequency in a Pediatric Surgeon practice. The objective of this study is to analyze causes and results of these procedures.

METHODS
A retrospective study was designed, including all patients who underwent to thyroid gland surgery between November 1997 and November 2018. Demographics, diagnosis, presence of MEN syndrome, surgical procedure, histologic findings and postoperative complications were registered.

MAIN RESULTS
39 patients were included, with a mean age at surgery of 106 ± 55 months. The most common diagnostic was MEN 2 syndrome (24 MEN 2A and 1 MEN 2B), followed by papillary carcinoma (5), multinodular goiter (3), follicular adenoma (2), follicular carcinoma (1), thyroglossal duct papillary carcinoma (1), thyroid adenoma (1) and a Graves-Basedow disease (1). Surgical techniques performed were: 34 total thyroidectomies, (70% (24) were prophylactic) and 4 hemithyroidectomies. Additional lymphadenectomy was needed in 9 cases. No intraoperative complications were found. Median length of postoperative stay was 1.3 ±0.6 days. No recurrent laryngeal nerve injury or hypoparathyroidism were registered in the follow-up period. In the pathologic analysis of the prophylactic thyroidectomy 14 C-cell hyperplasia without atypical cells, 4 with atypical cells, 3 microcarcinoma and 3 normal thyroid tissue were found.

CONCLUSION

Surgical intervention of the thyroid gland is a safe procedure when it is performed by an experienced team. Although it is an uncommon procedure, thyroid surgery is increasing due to the early diagnosis of MEN 2 syndrome.

PW16BS09: ONE-STOP-SURGERY: AN EFFICIENT AND COST-EFFECTIVE INNOVATION IN PEDIATRIC INGUINAL HERNIA REPAIR

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AIM
One-stop-surgery allows for same-day outpatient clinic visit, preoperative assessment and surgical repair; however, it is not or rarely done in children. This study assessed the efficacy, satisfaction and cost-effectiveness of one-stop inguinal hernia surgery in children.

METHODS
A prospective comparative study was performed in patients (aged 3 months-18 years, ASA I-II) with inguinal hernia diagnosed by general practitioner or pediatrician, and eligible for regular day-care surgery. Consecutive patients referred between 1/5/2017-1/11/2018 were screened and, if willing to participate, scheduled for one-stop-surgery (intervention). Patients scheduled for regular treatment were included in the control group. Parent-reported satisfaction and cost-effectiveness were evaluated using the PedsQL Healthcare Satisfaction and Productivity Cost Questionnaire (*i*PCQ).

MAIN RESULTS
Ninety-three patients (intervention n=54, control n=39) were included. Following one-stop-surgery, 53 patients (98.1%)(median [IQR] age: 5 [3-6] years) were first seen at our outpatient clinic and discharged at the same day. Post-operative complication rates were equivalent in the intervention and control group (1.9% vs 2.6%, p=1.000). Overall satisfaction was higher after one-stop-surgery compared to the control group (81.5 vs 67.6, p<0.001), which was in line with separate satisfaction categories (general satisfaction, information, inclusion of family, communication, technical skills, emotional needs). Median [IQR] number of hospital visits was reduced in the intervention group (1[1-1] vs 3[2-3], p<0.001), leading to a decrease in healthcare costs.

CONCLUSIONS
One-stop inguinal hernia repair in children is safe and feasible. One-stop-surgery improves patient and family satisfaction, reduces the number of hospital visits, work and school absence and decreases direct healthcare costs.

PW16BS10: PEDIATRIC PILONIDAL SINUS DISEASE: TO CLOSE OR NOT TO CLOSE AFTER THE SURGICAL EXCISION

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INTRODUCTION
Pilonidal sinus disease (PS) is a common condition which warrants surgical intervention. Best surgical technique in children is still under discussion. Our aim was to evaluate the outcome of excision with or without primary closure.

METHODS
Between 2013-2018, patients who presented PS disease and underwent either excision with closure (EC group) or excision with no closure (ENC group) were included. The outcomes recorded were sinus size, number of drainage before surgery, wound infection at the time of surgery, wound dehiscence, pre/postoperative antibiotic treatment, healing time, number of outpatient clinic visits, and recurrence rate.

RESULTS
A total of 57 (29 women) patients were divided into EC group (29) and ENC group (28). Mean age in EC group was 14±1 and 16±1 in ENC group ($p<0.05$). We did not find significant differences in sinus size, number of drainage, wound infection at time of operation, pre/postoperative antibiotic treatment, and recurrence rate between two groups ($p>0.05$). Postoperative partial wound dehiscence was 26% in EC group. Patients in EC group had a significant shorter mean healing time [60 days (9-240) vs 98 days (30-450) ($p<0.05$)] and fewer postoperative outpatient clinic visits [4 (0-6) vs 8 (2-11) ($p<0.05$)].

CONCLUSIONS
One out of four patients from excision and closure group presents partial postoperative wound dehiscence. However, overall healing time and number of postoperative outpatient clinic visits were significantly lower in EC group compared with ENC group. Our results support excision and closure as the best surgical treatment for children with PS

PW16BS11: MIDLINE CERVICAL CYSTS IN CHILDREN: THE IMPORTANCE OF ULTRASOUND

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AIM OF THE STUDY
To assess the sensitivity and specificity of ultrasound in the presumptive diagnosis of thyroglossal duct cysts (TGDCs) undergoing surgery and its correlation with surgical findings.

METHODS
Retrospective study of 150 patients undergoing surgery for midline neckmasses suggestive of TGCD (2008 - 2018). Epidemiological variables were collected. Ultrasound image at diagnosis was correlated with surgical findings, considering previous episodes of infection.

MAIN RESULTS
The mean age at surgery was 3'9 years old (9 months-12 years). Out of 150 patients, 110 had ultrasound compatible with TGCD, confirming the diagnosis with surgical findings in 80 cases.

There were 40 patients with non-compatible TGCD's ultrasound image. 15 of them were eventually diagnosed with TGCD. Surgical findings reported 49 dermoid cysts, 4 lymph nodes and 2 vascular malformations.

Therefore, the ultrasound sensitivity was 84% and the specificity 45%, with a positive predictive value of 73% and a negative predictive value of 62%. 62.1% (59) of TGCDs had a previous episode of infection, requiring 16.7% surgical drainage. The recurrence rate after Sistrunk procedure was 13.6% (8). Neither drainage (spontaneous or surgical) or previous episodes of infection reported statistically significant relationship with recurrence of the TGCD.

CONCLUSIONS
In our experience, despite the importance of ultrasound to evaluate eutopic thyroid on suspicion of TGCD, its result in the study of cervical cysts has low specificity. The criteria of the physician should prevail over ultrasound findings. Other imaging techniques could be useful.

PW16BS12: SURGICAL MANAGEMENT OF PEDIATRIC THYROID AND PARATHYROID PATHOLOGIES -SINGLE CENTER EXPERIENCE

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AIM
Recently number of pediatric patients with surgical thyroid pathologies is increasing with an inclining malignancy incidence. We herein present our thyroid and parathyroid surgery experience and preliminary results.

MATERIAL AND METHODS
The records of 24 patients underwent surgery for thyroid and parathyroid pathologies between 2009-2018 have been reviewed retrospectively.

RESULTS
Eight patients presented with a neckmass. Family history was positive in 13 patients. Ultrasonographic examination showed thyroid nodules in 16 patients, diffuse thyroid pathology in 6 patients, parathyroid adenoma in 2 patients. Fine needle aspiration biopsy (FNAB) was performed in 11 patients with 4 malign results. Unilateral total thyroidectomy was performed in 6 patients, total thyroidectomy in 16 patients and parathyroidectomy in 2 patients. In 3 patients who underwent unilateral thyroidectomy with a benign pathology reported during intraoperative frozen section examination, underwent secondary total thyroidectomy as thyroid malignancy was reported at the final gross histopathological evaluation. 10 of the 16 patients with a thyroid nodul had a family history. 81% of the patients with nodules had a malign histopathology. Among the patients with benign/suspected FNAB results, 71% malign histopathology reported postoperatively.

CONCLUSION
Early diagnosis of thyroid malignancies is important for early surgical intervention. Patients with beningn/suspected FNAB and frozen biopsies with a family history are candidates for total bilateral thyroidectomy to avoid a secondary surgery.

CR01: IN SITU HYPOTHERMIC LIVER PRESERVATION INCREASES THE HEPATIC RESECTABILITY IN CHILDREN WITH TUMORS INVOLVING THE LIVER

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AIM OF THE STUDY

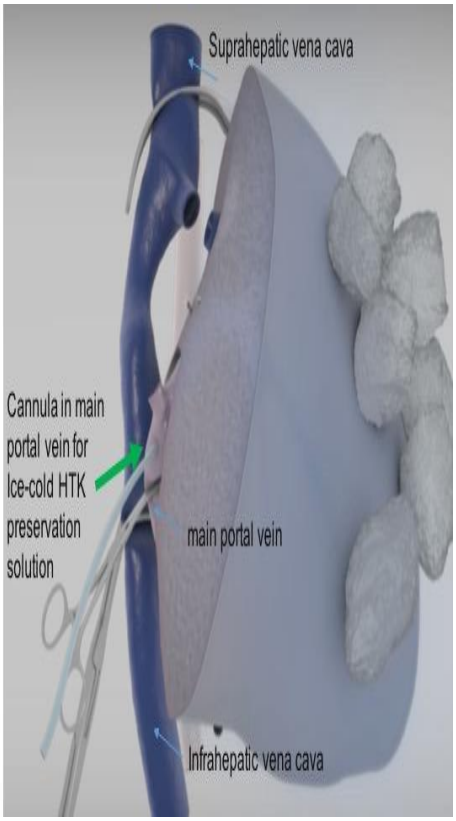
Large liver tumors in children involving the liver hilum, the main hepatic veins or the retrohepatic inferior vena cava are often deemed unresectable. The surgical approach for these tumors is technically challenging as it may require major liver resection, vascular reconstruction and extracorporeal circulation. *In situ* hypothermic liver preservation entails total vascular exclusion of the liver, with perfusion using cold histidine-tryptophan-ketoglutarate (HTK) preservation solution via a portal venous cannula during the dissection of the involved vascular structure. This approach has been used successfully – if sparingly - in adults but has not often been used in children. Herein, we present two children who were managed with this approach.

CASE DESCRIPTION

A 12-year-old boy presented with a large pheochromocytoma arising from the right adrenal gland and infiltrating the liver. He underwent a right hepatectomy with caudate resection, IVC resection (reconstructed with PTFE graft), en-bloc right adrenalectomy, and nephrectomy. The second patient (12 months old) underwent an extended right hepatectomy for hepatoblastoma with resection and reconstruction of the left hepatic vein and roux-en-y hepaticojejunostomy (Figure). Both cases were successfully managed with *in situ* hypothermic liver preservation, which was well tolerated as evidenced by preserved hepatic synthetic function in the post-operative period. Both children are in complete remission after 10 and 6 months respectively.

CONCLUSIONS

In situ hypothermic liver preservation is a promising hybrid technique that allows resection of large hepatic tumours even in children that were previously considered only for liver transplantation or palliation.



CR02: USEFULNESS OF REAL-TIME INDOCYANINE GREEN FLUORESCENCE IMAGE-GUIDED SURGERY FOR KASAI'S PROCEDURE – FOR FINE, RELIABLE AND ACCURATE OPERATION

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AIM OF THE STUDY

Kasai's procedure is the treatment of choice as the initial surgery for biliary atresia (BA). Key points of Kasai's procedure are dissection of the fibrous cone at an appropriate depth and anastomosis of the jejunum without damaging the exposed micro-bile ducts. However, decisions concerning these key points mainly depend on the experience of the pediatric surgeon. Recently, indocyanine green near-infrared fluorescence imaging (ICG-FCG) was developed for real-time vascular mapping, detecting lung metastatic lesions of hepatoblastoma and cholangiography. We have implemented ICG-FCG-based guidance in Kasai's procedure in order to visualize the micro-bile duct intraoperatively.

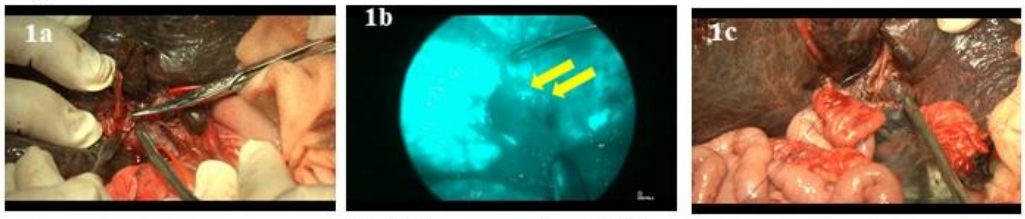
CASE DESCRIPTION

A two-month-old boy presented with jaundice and whitish stool. He was evaluated by cholescintigraphy and diagnosed with BA. He underwent ICG injection before Kasai's procedure. Our operative procedure for BA is similar to the original Kasai's procedure (Fig.1a). Following dissection of the fibrous cone, the porta hepatis was monitored intraoperatively using an infrared camera. Spotty fluorescence in the small bile ducts was observed at the right side of the porta hepatis (Fig.1b), guiding the appropriate level of dissection for the fibrous cone and the identification of the resected margin of the anastomosis of the jejunum to avoid damaging the exposed micro-bile ducts (Fig.1c). The postoperative course was uneventful, and his jaundice was improved. The patient is now six months old without any complications, including no choledochitis or growth impairment.

CONCLUSION

Real-time-ICG-FCG-guided surgery enables surgeons to perform objective assessments intraoperatively and facilitates safe, effective and accurate operations.

Figure



Dissection of the fibrous cone.

Spotty fluorescence in small bile ducts was observed at the porta hepatis by an infrared camera after dissection of the fibrous cone.

Anastomosis the jejunum without damaging the exposed micro-bile ducts.

CR03: MANAGEMENT OF PEDIATRIC CHRONIC CALCIFIC PANCREATITIS WITH EXTRACORPOREAL SHOCK WAVE LITHOTRIPSY

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AIM

Chronic pancreatitis in childhood is very rare and causes chronic/relapsing abdominal pain, frequent hospitalizations, malnutrition, retarded growth, and stone formation in main duct. Although pancreatic stone (PS) management is standardized in adults commonly with pancreatic extracorporeal shock wave lithotripsy (P-ESWL), there is no consensus on management of PS in children. A child with multiple PS who was treated with ESWL has been presented.

CASE

A 14 year-old girl was admitted with abdominal pain and elevated pancreatic enzyme levels. Abdominal US showed irregularity and rough echogenicity in pancreas revealing pancreatitis. At her second admission, ERCP was performed and partial divisum, dilated pancreatic duct, thickened pancreatic secretion were detected. Endoscopic sphincterotomy was performed. At her fourth admission, multiple stones were seen in main pancreatic duct on MRCP. Endoscopic removal of stones could not be achieved since the largest stone was 17x8 mm. P-ESWL was performed using electromagnetic lithotripter (Siemens modularis variostar-Cplus, Erlangen, Germany) under general anesthesia. Following ESWL, ERCP was performed showing that stones were fragmented. No ESWL-related complication was observed. Pain relief was achieved. The patient is still under follow-up regarding endocrine and exocrine function of pancreas.

CONCLUSION

ESWL is an effective and safe management option in pediatric PS which could not be removed by ERCP. The patients managed with ESWL should be followed-up for a long time regarding to endocrine and exocrine functions of pancreas. As in management of adult pancreatitis, clinical guidelines are needed regarding the management of pediatric PS.

CR04: HARLEQUIN SYNDROME AFTER THORACOSCOPIC REPAIR OF A CHILD WITH TRACHEOESOPHAGEAL FISTULA (TEF)

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BACKGROUND
Harlequin syndrome (HS) is a rare dysautonomia of the sympathetic nervous system leading to asymmetric facial flushing and sweating. In the literature, two cases of HS after thoracoscopic TEF repair are reported. As studies on long-term complications of thoracoscopic approaches in the newborn emerge, a possible connection of HS to the procedure cannot be ignored. We report on a newborn with TEF who developed HS after thoracoscopic repair.

CASE DESCRIPTION
On day 1 of life, the girl (3480g, GA: 41w) underwent thoracoscopic repair of a Type C esophageal atresia (TEF; OR time 105 min) without complications.The postoperative course was uneventful, the patient swallowed and thrived well and did not require esophageal dilations. At 2 years of age, missing facial flushing, transpiration and warming on the right side of her face during agitation was noticed (Fig.1). However, no further intervention was required. The girl and her parents adapted well to the symptoms.

CONCLUSIONS

We report the third case of postoperative HS following thoracoscopic repair of a TEF. All cases developed HS at least 2 years after surgery. The late onset of HS after the procedure opposes a direct causal relation to the thoracoscopic operation although further investigations are inevitable. While TEF is associated with other forms of autonomous disturbances, a shared embryological pathogenesis, like a neurocristopathy, of TEF and HS seems also possible.

Fig.1 3-year old girl with loss of facial flushing and warming of the right side after exertion (Picture displayed with permission of the parents).

CR05: PRIMARY UMBILICAL ENDOMETRIOSIS IN AN ADOLESCENT GIRL:UNSUSPECTED PATHOLOGY

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AIM

Endometriosis affects 7%–10% of women of reproductive age. Primary umbilical endometriosis (PUE) is an even rarer with unclear pathogenesis (less than 40 single case reports in the English literature). We report a case of PUE possibly the youngest patient reported in the literature.

CASE DESCRIPTION

Sixteen year old girl presented with painful umbilical lump for 2- 3 months duration with background history of precocious puberty, cyclical vomiting and menorrhagia. Clinical examination showed tender, irreducible umbilical lump. A provisional diagnosis of incarcerated umbilical hernia was made. Abdominal X-ray showed no features of intestinal obstruction. Ultra sound scan showed heterogeneous echogenic material (2 x 1.5cm) within the umbilicus with no visible bowel loops or peristalsis. The appearances were reported as consistent with an umbilical hernia with narrow neck possibly containing mesentery or intra-abdominal fat. Patient underwent urgent exploration of umbilicus under general anaesthetic. At operation, a firm mass was excised and sent for histology. The underlying fascia and peritoneum was repaired. The excised tissue was confirmed endometriosis on histology. She developed painful umbilical lesion 8 months later and had further exploration. Tissue excised was reported as fibrous tissue on histology; no recurrence of endometriosis. Follow-up continues in the Endometriosis clinic.

CONCLUSIONS

Umbilical endometriosis should be considered in differential diagnoses of painful umbilical lesion in women of reproductive age. Complete excision and histology is highly recommended for obtaining a definitive diagnosis, exclude malignancy and to prevent recurrence.

CR06: PREOPERATIVE BOTULINUM TOXIN TYPE 'A' FOR ABDOMINAL WALL RECONSTRUCTION IN CHILDREN: CASE REPORT

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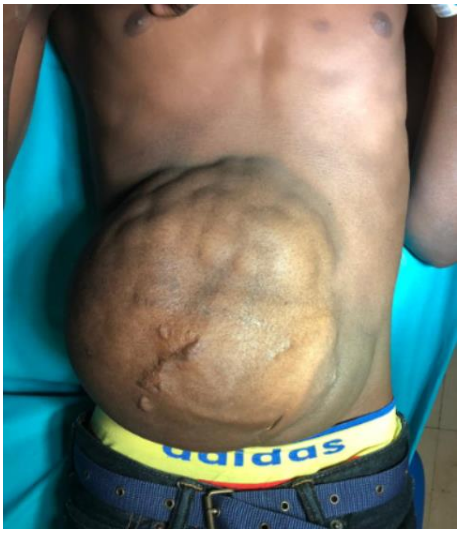
AIM OF STUDY
Complex ventral hernia repair remains challenging. Temporary paralysis of abdominal wall muscles with pre-operative botulinum toxin-A (BTA) injections has been described in adult patients in order to help primary closure.
We present a successful case of BTA injection previous to repair a giant hernia with abdominal loss of domain, in an infant.

CASE DESCRIPTION
An African 12 year-old male, with history of spontaneously healed omphalocele, came to the Emergency Room with abdominal pain and emesis. He presented a painful irreducible giant ventral hernia. Nasogastric decompression improved symptoms. Abdominal X-ray, ultrasound and Upper GI series demonstrated an enlarged stomach and transit, although the hernia sac remained irreducible due to loss of domain.

Further image studies confirmed a central abdominal wall defect (size 12 x 10 cm) with small bowel and practically the entire colon inside the sac.



Under ultrasound guidance, BTA was injected into the abdominal muscles (oblique, transverse and rectus). No related complications occurred. Six weeks later, physical examination revealed a gain of 3 cm/side of the lateral abdominal wall.

Hernia repair was performed by Rives-Stoppa technique. Postoperative course was uneventful. Due to unraised intra-abdominal pressures, mechanical ventilation after surgery was no necessary. Full enteral feeding was achieved 72 hours later. Patient was discharged on the fourth postoperative day. No hernia recurrence was observed after a follow-up period of 6 months.

CONCLUSIONS
We suggest preoperative abdominal injection of BTA as a safe and effective procedure that facilitates primary fascial closure in complex ventral hernia repair in children.

CR07: LAPAROSCOPIC EXCISION OF PROSTATIC UTRICLE UNDER CYSTOSCOPIC GUIDANCE

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AIM
Prostatic utricle (PU) may cause recurrent urinary tract infections (UTI), stone formation, postvoid dribbling, recurrent epididymitis. Surgical excision is the treatment choice in symptomatic cases. However, surgical access to PU has been challenging. A case was presented to discuss laparoscopic management of PU in children.

CASE
A 3 year-old patient was admitted with disordered sexual development with karyotype of 47,XYY/46,XY. He had penoscrotal hypospadias, bifid scrotum, asymmetrical gonads. He has been experiencing recurrent UTI. Voiding cystourethrogram demonstrated large PU (IKOMA II). Cystoscopy was performed confirming PU. The cystoscope was left in situ to aid laparoscopic exploration. A 5-mm umbilical port was inserted by Hasson technique and pneumoperitoneum was created. Two additional 5-mm ports were inserted in both lower quadrants. The peritoneum was dissected behind bladder. The cystoscope in PU was used as guidance in identification and dissection of PU. Bilateral vas deference was identified and could be separated. The neck of PU was ligated with surgiloop. PU was retrieved from umbilical port. Postoperative VCU revealed normal posterior urethra. He did not experience any further UTI under 6 months follow-up.

CONCLUSION
Open surgical techniques in PU management are challenging to perform because of poor exposure, high risk of injury to adjacent structures and risk of incomplete excision. Laparoscopy is safe and feasible alternative in surgical management of PU, by providing good visual exposure, easy dissection in deep pelvis, improved cosmesis and potentially lower risk of complications. The cystoscopic guidance is an important aid in identification and dissection of PU.

CR08: ATRAUMATIC SPLENIC RUPTURE SECONDARY TO VASCULAR EHLERS-DANLOS SYNDROME SUCCESSFULLY MANAGED BY COIL EMBOLISATION OF THE SPLENIC ARTERY

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AIM

Atraumatic splenic rupture is uncommon and life-threatening. It may be related to underlying pathology and be the initial manifestation of the condition. Vascular Ehlers-Danlos Syndrome (V-EDS) is a rare autosomal dominant collagen vascular disorder, associated with vessel fragility and rupture. We describe a child presenting with splenic rupture managed by embolisation of the splenic artery. She was subsequently diagnosed with V-EDS.

CASE DESCRIPTION

An 11-year-old girl with thalassemia trait presented with sudden onset abdominal pain and hypovolaemic shock. There was no history of trauma. Following resuscitation, abdominal CT showed haemoperitoneum and active splenic arterial extravasation. Angiography demonstrated 4 bleeding points, from irregular vessels supplying the upper two-thirds of the spleen. These were not amenable to supra-selective embolisation. Therefore, coil embolisation of the main splenic artery was performed, with no splenic supply seen on the post-embolisation angiogram. Her postoperative recovery was complicated by pancreatitis secondary to partial ischaemia of the pancreatic tail.

Subsequent extensive investigations excluded haematological, myeloproliferative and infective causes for her splenic rupture. A safeguarding investigation was completed, with no pertinent factors identified. Findings of thin skin, abnormal bruising and hypermobile joints raised a clinical suspicion of a connective tissue disorder. Genetic testing revealed a de novo mutation of the COL3A1 gene.

CONCLUSIONS

There are only 4 reports of V-EDS causing splenic rupture in adults. Three had a prior diagnosis of V-EDS. All underwent splenectomy. This is the first case of V-EDS presenting with splenic rupture in a child and the only case managed minimally invasively by embolization.

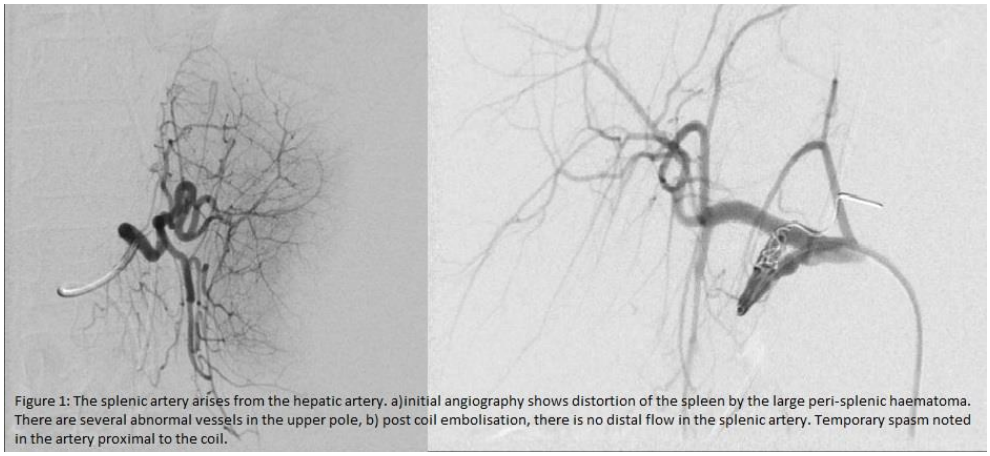

Figure 1: The splenic artery arises from the hepatic artery. a)initial angiography shows distortion of the spleen by the large peri-splenic haematoma. There are several abnormal vessels in the upper pole, b) post coil embolisation, there is no distal flow in the splenic artery. Temporary spasm noted in the artery proximal to the coil.

CR09: BRONCHIAL RING APLASIA. A RARE ENTITY

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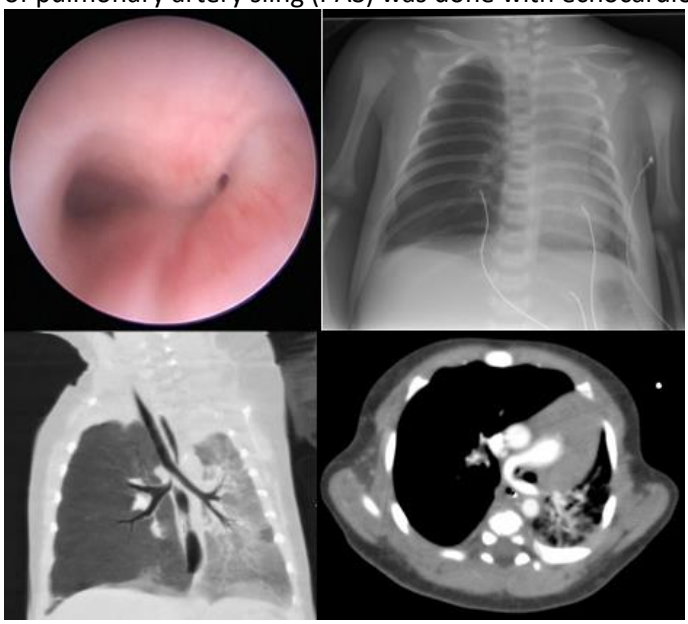
INTRODUCTION

Congenital malformations of the trachea include a variety of rare conditions with a prevalence estimated to range between 0.2 and 1 in 10,000 and limited data available in publications. One must be aware of this anomaly when examining a newborn with respiratory distress.

CASE

A newborn was referred to our institution with stridor and respiratory distress. He was born at term with no prenatal issues.

Chest X-ray showed a right lung hyperinflation with mediastinal deviation and collapse of the left lung. Rigid bronchoscopy revealed a very narrow opening in the proximal right main bronchus. Afterwards, diagnosis of pulmonary artery sling (PAS) was done with echocardiogram. Both were confirmed by CT-scan.



He underwent an slide broncho-tracheoplasty under cardiopulmonary bypass, sliding the right bronchus over the trachea. Diagnosis of bronchial ring aplasia was confirmed at that moment. PAS was corrected at the same time. Postoperative course was uneventful. After 3 years of follow-up, he remains asymptomatic.

CONCLUSION

The diagnosis of bronchial ring aplasia associated to PAS should be considered in a patient with stridor and unilateral lung hyperinflation

One stage correction for the vascular defect and the bronchial stenosis must be done.

CR10: THE FIRST REPORTED PEDIATRIC CASE OF PRIMARY MYOEPITHELIAL CARCINOMA INVOLVING THE WHOLE LUNG: SURGICAL RADICAL TREATMENT AND PROSTHESIS IMPLANT

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AIM OF THE STUDY

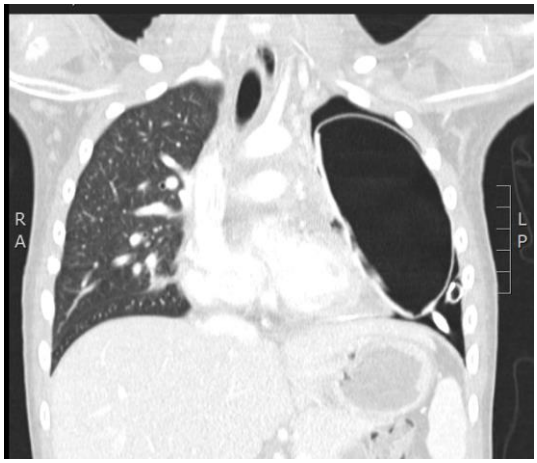
Primary myoepithelial carcinoma of the lung (PMC-L), arising from bronchial glands in lower respiratory tract, is exceedingly rare. To date few cases in adults and only one pediatric case have been recorded. Aim of our study is to report the first case of PMC-L successfully removed in a child, focusing on the importance of multidisciplinary primary surgery for the treatment of this tumor.

CASE DESCRIPTION

Seven-year-old girl admitted for persistent cough and fever, unresponsive to oral antibiotic. Chest X-ray showed loss of volume of left lung sustained by almost total atelectasis. After routine clinical investigations, she was referred to CT-scan and MRI that documented presence of a mass occupying the entire left upper lobe, infiltrating the pulmonary hilum (main bronchus, pulmonary artery, superior pulmonary vein, pericardium). After multidisciplinary evaluation, histopathologic diagnosis of PMC-L was obtained by US-guided trans-thoracic core needle biopsy and bronchoscopic biopsies. Patient was then submitted to left pneumonectomy under extracorporeal circulation and positioning of a thoracic expander filled with 200 ml of saline solution. Postoperative course was uneventful. With TREP consent radiotherapy was performed (61.2Gy). At 10 months follow-up the girl is alive, breathing normally without any oxygen support, no recurrence of PMC-L neither metastasis occurred, and no deformities of chest appeared.

CONCLUSIONS

This is the first case of pediatric patient successfully operated for PMC-L. Extracorporeal circulation enabled to perform radical primary surgery. Prosthesis implant not only kept the normal chest expansion but also allowed focused radiotherapy, avoiding damage to vital organs.



CR11: WHEN IT DOESN'T FIT: CONGENITAL CHOLEDOCHAL ANOMALIES OF THE COMMON HEPATIC DUCT

Helena Reusens, Mark Davenport
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AIM OF THE STUDY
Choledochal Malformation is characterised by biliary (intra or extra-hepatic) dilatation. Five types (1-5) are recognised in Todani's classification and its modifications, of which Type 1 and 4 typically have an associated anomalous pancreato-biliary junction and common channel and involve the whole duct. We describe two cases with previously undescribed morphological features which did not fit.

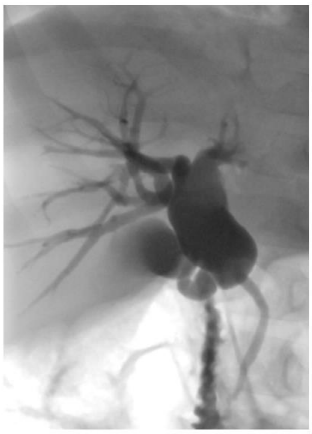
CASE DESCRIPTION
#A: Preterm (31 weeks) boy of Nigerian parentage. Mother was HIV+ve and he was treated with nucleoside reverse transcriptase inhibitors following birth. He had persistent cholestatic jaundice and a dilated bile duct (10 mm) from birth. Although the jaundice resolved the dilatation persisted and increased coming to surgery aged 2.5 years. This showed cystic dilatation confined to CHD only and an otherwise normal distal common bile duct and no CC.

#B: Antenatal detection of a cyst at porta hepatis in girl of South Asian parentage. Post-natal confirmation of cyst (20 mm diameter) with no evidence of biliary obstruction. Surgical exploration carried out at 12 weeks. She had an isolated cystic dilatation of the right-hepatic duct only . The left hepatic duct and CBD were otherwise entirely normal.

Neither had evidence of a common channel (low bile amylase). Both underwent resection with Roux-en-Y hepaticojejunostomy reconstruction to the proximal CHD in case A and to the transected right hepatic duct alone, leaving the preserved left duct and CBD in continuity in case B.

Conclusions

- Neither choledochal anomaly was typical.
- Both appear congenital and Case B appears unique in the literature.



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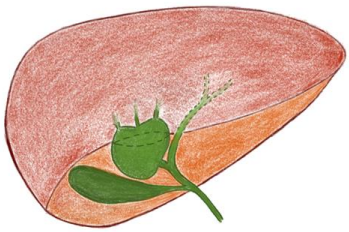

B

CR12: VIDEO-ASSISTED TRANSAXILLARY APPROACH: A MINIMALLY INVASIVE TECHNIQUE FOR RESECTION OF THE FIRST RIB

Beatriz Fernández-Bautista, Maria Antonia García-Casillas, Julio Cerdá, Manuel De la Torre, Javier Ordóñez, Agustín Cañizo, Laura Pérez Egido, María Fanjul, David Peláez, Esther Molina, Juan Carlos De Agustín
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AIM OF THE STUDY
The resection of the first rib is a surgical challenge due to its difficult access and correct exposure. Different techniques are described such as the supraclavicular, posterior, transaxillary or combined approach.

We present the case of a patient with a first rib osteochondroma in which a transaxillary approach was performed with endoscopic support.

CASE DESCRIPTION
16 year old patient with discomfort in left arm with exercise and diagnosis of osteochondroma of first rib.

In right lateral decubitus, with the left arm elevated and axillary exposure, an 8 cm axillary incision is made for the working instruments, transversal, between the anterior pectoralis major and the posterior dorsalis muscle. Introduction of 5mm 30º optics in the same wound to increase vision. Subpectoral dissection is performed, locating osteochondroma of the 1st rib that is embracing the subclavian vein, producing its compression and stenosis. Section of subclavian and anterior scalene muscles and exeresis of the upper portion of osteochondroma that separates from the sublcavian vein is performed. Posterior dissection of the rib at both ends of the osteochondroma and section of the same with release of soft tissue.

The patient shows good evolution, staying hospitalized for 4 days with good pain control.

The symptoms were completely resolved without associated complications and with a very good aesthetic result.

CONCLUSION
The transaxillary video-assisted approach is a novel and feasible technique in the resection of the first rib, as it improves visibility with a wide margin of safety, reducing the associated surgical complications.

CR13: A RARE CASE OF METASTASES IN THE UMBILICUS: SISTER MARY JOSEPH' NODE

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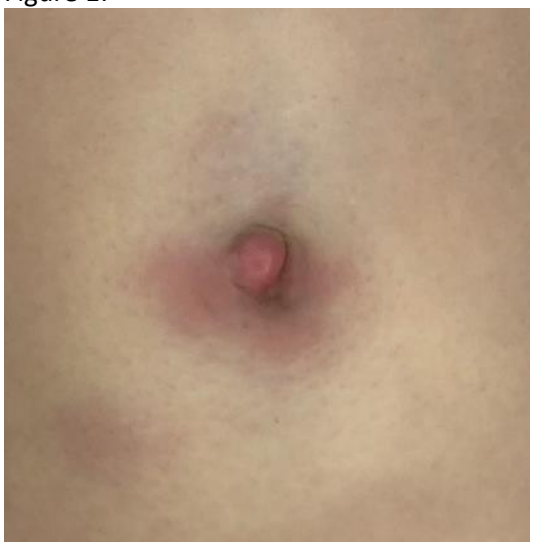
Hospital Sant Joan de Deu, Barcelona, Spain

AIM OF THE STUDY
To report a case of umbilical metastases in a child.

CASE DESCRIPTION
A previously healthy 13 year old girl was admitted due to a 2-week history of coughing, chest pain and the appearance of a red, swollen mass in the umbilicus (Figure 1) without any improvement despite antibiotic treatment for over a week. The physical exam showed multiple inguinal adenopathies, an increased abdominal perimeter and lower left chest hypophonesis. An ultrasound of the abdomen showed a mass depending of the stomach. A computerized tomography scan revealed multiple lymphadenopathies, peritoneal implants and left pleural effusion. Left inguinal lymph node was biopsied and the chest drained. Histology confirmed Burkitt' lymphoma. The patient started on a chemotherapy regimen according to Inter-B-NHL ritux 2010 protocol. Sister Mary Joseph' node improved rapidly after first chemotherapy infusion. After 4 months follow-up, the patient is without evidence of disease.

CONCLUSIONS
A sister Mary Joseph' node is a rare type of metastases in the umbilicus. It is encountered in 1% to 3% of patients with abdominal or pelvic malignancies. It's usually a sign of bad prognosis. Omphalitis not improving with antibiotics should rise our concern about other entities such as abdominal malignancies.

Figure 1:



CR14: TESTICULAR CONSTRICTION AS AN UNSUAL COMPLICATION FOR MECONIUM PERIORCHITIS

Clara Rico, Eva Sanz, Teresa M Cañas, Henar Souto, Manuel Espinoza, Cristina Riñón, Ana L Luis, Pilar Guillen, Cristina Garces, Juan Carlos Ollero
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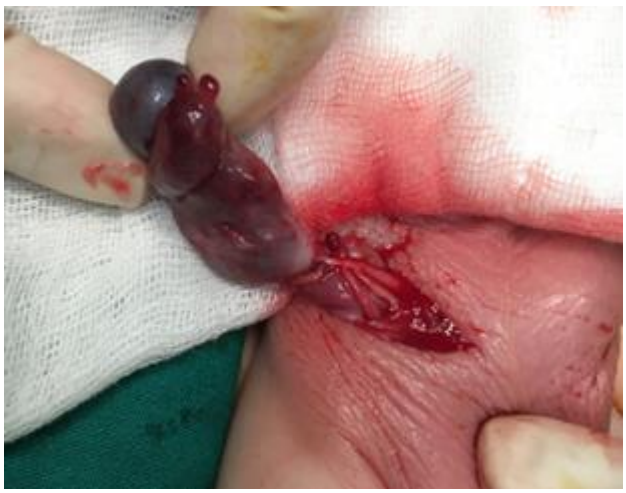
AIM OF STUDY
To describe a case of testicular constriction caused by fibrous bands associated to meconium periorchitis, an infrequent entity, in which free meconium from an antenatal intestinal perforation reaches the scrotum through a patent processus vaginalis.

CASE DESCRIPTION
We report a 7 month-old patient presenting with left scrotal swelling and pain. He had known history of meconium periorchitis and bilateral hydrocele, and was being managed conservatively with scheduled ultrasounds, finding in the last one right testicular hypotrophy. Neither of both testicles were palpable and a new testicular ultrasound was performed, confirming right testicular atrophy and normal sized left testicle without flow in Doppler sonography. Urgent surgery was performed, finding no testicular torsion, but several fibrous bands that were strangling the spermatic cord at the entrance of the scrotum, causing severe ischemia to the testicle. The right scrotum was also explored finding the same kind of adhesions and confirming right testicular atrophy, therefore, the left testicle was preserved and fixed. It seems likely that these string-like adhesions found in the scrotum could be consequence of the scarring due to chemical irritation caused by the meconium, in a similar way that happens in the abdominal cavity after a peritonitis. Our patient was discharged the next day, and the left testicle maintained normal size and vascular flow after 10 months follow up.

CONCLUSION
Meconium periorchitis is rare, and usually has an asymptomatic course that allows a conservative management. However surgery must be considered when there are signs of complications.



CR15: CONTINUOUS URINARY INCONTINENCE DUE TO ECTOPIC TRIPLICATED URETER. A CASE STUDY AND LITERATURE REVIEW

Ramy Waly[1], Brian Maccormack[2], David Marshall[1]
[1]The Royal Belfast Hospital for Sick Children, Belfast, United Kingdom. [2]Starship Hospital, Auckland, New Zealand

AIM OF THE STUDY
Ureter triplication is an extremely rare congenital anomaly of the urinary system. Continuous urinary incontinence due to ectopic distal insertion of one of the triplicated ureters is even more rarely seen. We present a case study of such a rare diagnosis and review of the available literature.

CASE DESCRIPTION
In this case report, we describe a 2½ year-old girl presenting with continuous urinary incontinence noted since soon after birth. A complete work-up eventually confirmed the presence of an ectopic type-I triplicate ureter with a contralateral normal single system. Diagnosis was clinched using repeat magnetic resonance urography (this time a dynamic study) after a positive methylene-blue test.

Review of the available literature regarding similar diagnoses was performed searching the PubMed database for 'triplicated, triplicate or triplex ureter' and 'wetting or incontinence' with no time or language restriction.

The diagnosis of ureteric triplication presenting as paediatric urinary incontinence is extremely rare. Only 3 papers with a similar diagnosis were found in the literature, including non-English literature. All are cases studies.

CONCLUSIONS
Although this diagnosis is exceedingly rare, it should be considered during the investigation of continuous urinary incontinence due to a presumed ectopic ureter when the insertions of all demonstrated ureters have been accounted for.

CR16: LAPAROSCOPIC ASSISTED DESCENDING COLOSTOMY FOR ANORECTAL MALFORMATION: AN EASY WAY TO AVOID WOUND COMPLICATIONS

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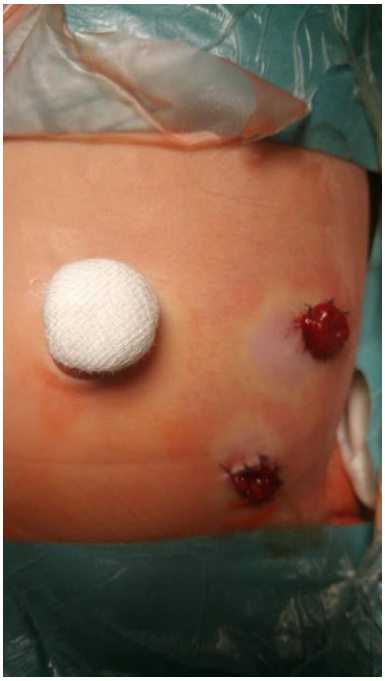
University Clinical Hospital , Valladolid, Spain

AIM OF THE STUDY
Open descending colostomy with separated stomas is the standard technique for colostomy creation in patients with anorectal malformations (ARM). However, wound complications may develop due to dehiscence, infection or incisional hernia. Laparoscopic assisted descending colostomy is described in a newborn with recto-vestibular fistula, avoiding surgical incision between stomas and, subsequently, potential complications derived from this incision.

CASE DESCRIPTION
Standard preoperative ostomy position is marked in the left lower quadrant. 5 mm trocar is placed through the umbilicus and pneumoperitoneum is created. 3 mm trocar is inserted in mucous fistula position previously set. Transition point between descending colon and sigmoid is identified using a laparoscopic grasp. Transition point is exteriorized across 1 cm incision in colostomy position formerly marked. Transition point is divided, previous placement of stay sutures in proximal and distal portions, and distal bowel is cleaned out of meconium. Proximal stoma is everted and mucous fistula is made flat and small across marked abdominal incisions, previous laparoscopic view of the right position of intestinal segments. Finally, umbilical port is closed by layers.

CONCLUSIONS
Laparoscopic assisted descending colostomy has the great advantage to avoid surgical incision between ostomies in patients with ARM, avoiding secondary wound complications and making easier the posterior colostomy closure. Due to its high reproducibility and outstanding advantages, laparoscopic assisted descending colostomy should be the standard approach for patients with ARM.



CR17: IDIOPATHIC FEMORAL ARTERY THROMBOEMBOLISM IN A NEWBORN – CASE REPORT AND REVIEW OF THE LITERATURE

Ádám Radványi, László Sasi-Szabó
University of Debrecen, Department of Pediatrics, Debrecen, Hungary

Spontaneous arterial thromboembolism is a rare emergent condition associated with high morbidity. We present a case of femoral occlusion treated successfully by surgery and summarize available literature on this specific topic.

A female infant was born on the 37. gestational week with Caesarean section from a complicated pregnancy. She was noticed to have a pale, then livid right leg just after birth. Peripheral pulse was not palpable. Doppler ultrasonography demonstrated a thrombus in the right external iliac artery. She underwent urgent femoral arteriotomy and desobliteration at the age of 4 hours. In the postoperative course she received intravenous sodium heparin (adjusted to the PTT value) for 11 days), acetylsalicylic acid (2-3 mg/kg for 6 weeks) and pentoxifylline (30 mg/kg) for 11 days. After uneventful recovery she was discharged home on the 20th postoperative day. After a follow-up of 6 months the limb has good circulation and control sonography shows no stricture on the affected artery.

The optimal management of neonatal idiopathic limb ischaemia is still under debate. We have found only a few articles about similar idiopathic cases and the evidence supporting different treatment approaches is not convincing enough. Successful management is based on early recognition and diagnosis of the aetiology. When both vascular and pediatric surgeon are present and the operation can be accomplished within a short time-frame, surgery seems to be an adequate choice for treatment. It is safe to say that further studies needed to evaluate the diagnostic and therapeutic algorithms of these cases.

CR18: NEOPHALLIC RECONSTRUCTION IN PENILE AGENESIS OUTCOMES IN TWO CASES

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AIM OF THE STUDY
Penile agenesis is a very rare congenital anomaly, usually associated with other malformations. An optimal age for phallic reconstruction, as well as treatment approaches are still debated. We present surgical treatment and outcomes in two cases of aphallia.

CASE DESCRIPTION
Two boys with penile agenesis, aged 3.5 and 4 years, underwent two-stage genital reconstruction at our institution from June 2015 to October 2018. Initially, ureterocystoneostomy was performed in both patients due to associated anomalies, primary megaureter and high-grade unilateral vesicoureteral reflux. Neophallic reconstruction was performed in two stages. A bird-wing abdominal phalloplasty was performed in the first stage. Six months later, second stage included creation of the neourethra by skin tubularisation and glans reconstruction. Follow-up ranged from 3 to 42 months. Length of the neophallus was 6.5 and 7 cm. Good aesthetic outcome and voiding in standing position were achieved in both cases. One urethral fistula occurred, and was repaired by minor surgery 3 months later. Parents of both patients reported satisfaction with surgical results.

CONCLUSIONS
A two-stage abdominal phalloplasty presents an excellent option for neophallic reconstruction in children with penile agenesis. Early creation of the neophallus is important for good psychosocial development. However, long-term follow-up is necessary for evaluation of patients' satisfaction in the future.

CR19: LAPAROSCOPİC BULLET REMOVAL IN A PENETRATING ABDOMINAL GUNSHOT IN CHILD

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INTRODUCTION
Gunshot wounds represent one of the most common causes of penetrating injuries. Injuries from weapons can be serious and even fatal, particularly in children. Although the penetrating abdominal trauma has been traditionally treated by exploratory laparotomy, diagnostic and therapeutic laparoscopy is a feasible approach in managing patients with penetrating abdominal trauma. In this video, it was aimed to present a penetrating retroperitoneal injury caused by an gunshot wounds, and the successful removal of the bullet via a laparoscopic approach.

CASE
A 13-year-old boy was admitted with a gunshot wound. The patient's clinical condition was stable. Physical examination revealed a 0,5x0,5cm diameter entry wound at the left lumbar area and left to the vertebral column. Computed tomography scan showed the bullet in the retroperitoneum 8mm and 3mm left to the renal vein and renal pelvis, respectively. A three-port laparoscopic transperitoneal approach was performed. The bullet was found next to renal hilum and removed laparoscopically. Operation time was 35 min. The surgery resulted without complications and posoperative course was uneventful. The patient was discharged on the second postoperative day.

CONCLUSION
Laparoscopic removal of bullet after gunshot wound in clinical stable children is a reliable and feasible .

CR20: EXTRAPERITONEAL POCKET SPLENOPEXY: THE METHOD OF CHOICE FOR WANDERING SPLEEN

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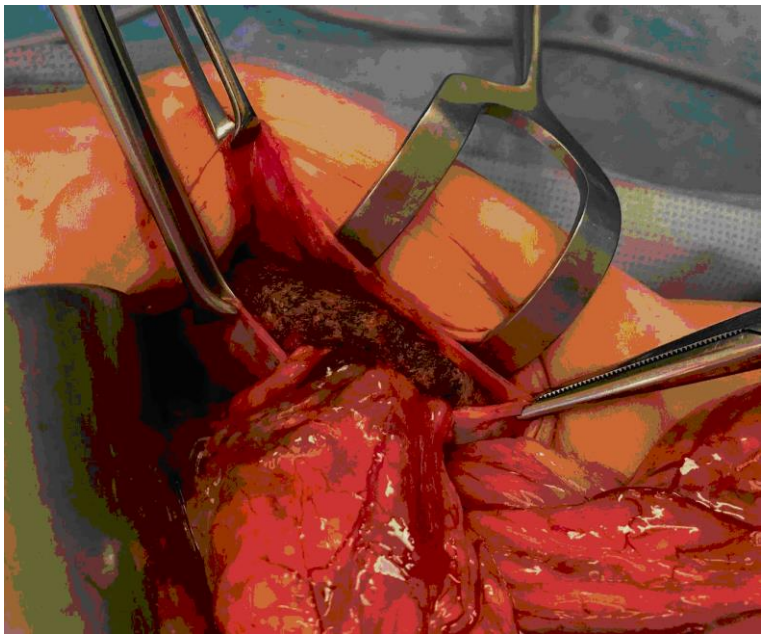
AIM OF THE STUDY
Wandering spleen is a rare condition difficult to diagnose. Splenopexy should be preferred to splenectomy. We report our experience with a technique for splenopexy in which the spleen is fixed into an extraperitoneal pocket.

CASE DESCRIPTION
A 4-year-old girl using growth hormone presented with a long-term history of frequent vomiting and episodes of abdominal colic. Gastrointestinal contrast study and ultrasound did not show any pathology, the upper endoscopy diagnosed a prepyloric membrane. Open surgery was indicated, in which a huge stomach and prepyloric antral membrane was found as well as further intestinal malrotation and wandering spleen in the right mesogastrium producing duodenal obstruction. Pyloroplasty with the antral membrane excision, Ladd procedure, and shortening of the long gastrosplenic ligament with placement of the spleen into the left hypochondrium was performed. Four months later the patient was hospitalised for the recurrence of severe abdominal colic. The relaparotomy showed an enlarged wandering spleen in the mesogastrium. Even though the spleen was the cause of the second surgery, the decision was to preserve the spleen. Partial splenectomy with fixing of the spleen into an extraperioneal pocket in the left hypochondrium was performed (Fig.1). The postoperative course was uneventful. Blood flow to the spleen is regularly monitored by Doppler ultrasound, follow-up care is provided by a hematologist.

CONCLUSIONS
In the presence of a wandering spleen, splenopexy should be considered as the method of choice. We suggest performing the extraperitoneal pocket splenopexy to preserve the immunological potential of the spleen.



CR21: SPIGELIAN HERNIA IN CHILDREN: TWO CASES OF A RARE DISEASE WITH DIFFERENT CLINICAL PRESENTATION

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AIM OF THE STUDY

Spigelian hernias are only the 0,1-2% of all ventral hernias and it is a very rare disease in children. It has been described its association with ipsilateral cryptorchidism until 53% of cases. We described two cases of Spigelian hernia with different clinical presentation, which were treated in our center in 2018.

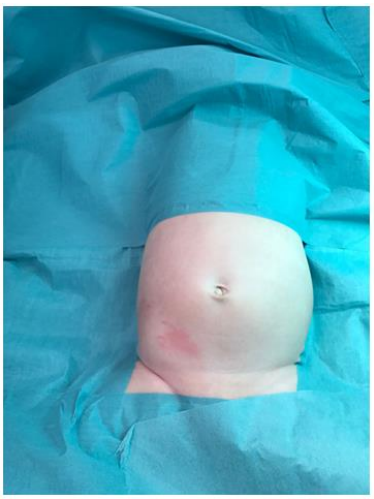
CASE DESCRIPTION

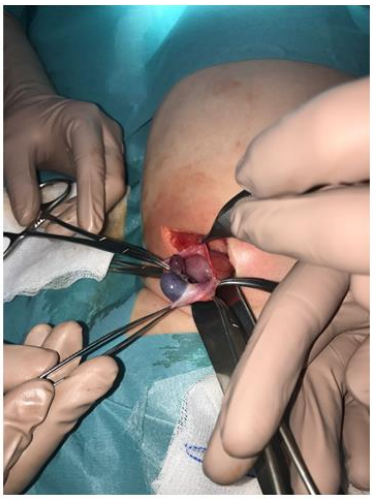
First case: A healthy 1 month-old baby, assessed at Emergency room by abdominal tumor in lower right quadrant (40x60mm). It was firm, not reducible, associated with irritability, with the beginning of the symptoms 6 hours ago. He was hemodynamically stable without signs of bowel obstruction. An ultrasonography showed an abdominal wall defect (7mm) being diagnosed with incarcerated Spigelian hernia. We attempted manual reduction without success, performing urgent surgical intervention: we opened the hernial sac, with later reduction of incarcerated bowel, orchiectomy (because testis was necrotic inside the sac) and herniorrhaphy.

Second case: A healthy 1 month-old baby, assessed at Emergency Room for abdominal mass in right iliac fossa (30x40mm), being diagnosed with uncomplicated inguinal hernia and ipsilateral cryptorchidism. Ambulatory ultrasound was performed, visualizing an abdominal wall defect (10mm) compatible with Spiegel's hernia. The patient underwent a planned surgery, performing dissection and opening of the hernia sac, individualization of the testis and spermatic cord (which was contained inside), orchidopexy and posterior herniorrhaphy.

CONCLUSIONS

Spiegelian hernia is an infrequent pathology that makes its diagnosis a challenge for pediatrics surgeons. The clinical suspicion should be confirmed with ultrasonography to allow a correct and early surgical treatment.





CR22: NUSS PROCEDURE FOR PECTUS EXCAVATUM AIDED WITH 3D IMAGING AND 3D PRINTING – A CASE REPORT

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THE AIM OF THE STUDY

The aim was to elucidate the role of 3D imaging and 3D printing as a preoperative planning tool in pectus excavatum surgery and to reveal possible benefits of using this technology including operative time, costs and comfort of the operating surgeon.

CASE DESCRIPTION

A 17-year-old pectus excavatum patient with high Haller index was admitted for a pre-operative chest CT scan. 3D images were created using BodyViz and Osirix software, and 3D printed model was created with Osirix, Meshmixer and Blender software. The 3D 1:1 model was used to plan the positioning of the stainless steel bars, their shape and configuration. Before surgery the 3D anatomy of the patient was presented to the operator using 3D stereoscopic system and exact landmarks were positioned on the patient's body. During surgery operative time and use of materials was recorded. Operative time was shorter than mean operative time in Nuss procedure and the operating surgeon felt comfortable throughout surgery. Additional 3D printing cost was 350 Euros.

CONCLUSION

In the presented case utilization of the 3D imaging and printing was beneficial for the surgery which mandates its further exploration.

CR23: INTRA-ARTERIAL CHEMOTHERAPY（IAC）AND SYSTEMIC CHEMOTHERAPY FOR TREATMENT OF VAGINAL RHABDOMYOSARCOMA IN CHILDREN THREE CASES REPORT

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AIM OF THE STUDY
We report 3 cases of vaginal rhabdomyosarcoma in children successfully treated with intra-arterial chemotherapy（IAC）and systemic chemotherapy.

CASE DESCRIPTION
From 2002 to 2013, three patients with histologically confirmed embryonal rhabdomyosarcoma of the vagina were treated with alternating IAC and systemic chemotherapy. One case of whom with pelvic metastasis at admission. The median age at diagnosis was 1.58 years (range 0.25-3 years).

IAC was performed using bilateral transcatheter internal iliac artery infusion with cisplatin (80 mg/m^2), pirarubicin (40 mg/m^2), and vindesine (3 mg/m^2). Intravenous chemotherapy consisted of vindesine, ifosfamide and etoposide starting 3 weeks after IAC. Patients received 1-3 cycles of alternating IAC and systemic chemotherapy. Vaginal tumors became necrotic and disappeared in all patients. One patient was operated for the pelvic metastasis. After complete remission, the patients received three courses of intravenous chemotherapy as consolidation treatment.

No drug-induced complications, such as cardiotoxicity, nephrotoxicity or hepatic dysfunction were observed except for moderate bone marrow suppression.Patients were followed-up for 6 to 15 years (median 12 years). Two patients were recurrence-free. One patient had pelvic metastasis 46 months after disappearance of vaginal tumor. She received two cycles of alternating IAC and intravenous chemotherapy again, then underwent pelvic tumor excision. The pathological examination revealed complete necrosis of the pelvic metastasis. She accepted local radiotherapy after surgery and remains disease-free for 7 years after operation up to now.

CONCLUSIONS
IAC combined with systemic chemotherapy for treatment of vaginal rhabdomyosarcoma tumors in children is safe and effective.

CR24: A RARE CASE REPORT OF CONGENITAL SIGMOID STENOSIS COMBINED WITH LADD'S BANDS

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Congenital colonic stenosis is one of the rarest GI anomalies in the newborn, even less common than colonic atresia. Only two cases of late onset have been reported in the last almost 50 years, none of them affecting the rectosigmoid tract. Association with other intestinal anomalies creates even more complicated case.

A 5-months-old girl was presented with diffuse abdominal distention and vomiting, and failure to thrive. Greyish, putty-like stools were passed after enema. Barium enema proved cone-shaped occlusion high in the sigmoid colon, and no evidence of Hirschsprung disease was shown. Laparotomy discovered significant narrowing of the sigmoid, which appeared to pass mainly gases. Bowels above the stenosis were considerably dilated, with thickened wall and full of putty-like stools. Ladd's bands, pressing the duodenum were also dissected. Sigmoid was open at the site of the stenosis and colostomy with two pouches performed.

After surgery the baby stopped vomiting, started regularly to pass yellowish stools from the colostomy and was tending to thrive normally. Elective surgical repair of GI tract was easilly performed six months later and the child was discharged healthy.

Although very rare, congenital colonic stenosis is possible cause of intestinal obstruction. It should be kept in mind, even in complicated cases of late onset and these resembling Hirchsprung disease. Colostomy with secondary repair of GI tract proved to be a method of choice in late-onset cases with dilated bowels.

GE201: CLINICAL FACTORS IN TRUNK CAPILLARY MALFORMATIONS IN THE NEONATE. WHEN TO SUSPECT OTHER ASSOCIATED MALFORMATIONS? A CASE-CONTROL STUDY

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AIM OF THE STUDY

Capillary malformations (CM) can be sporadic or syndromic, in association with other underlying venous (VM) or lymphatic (LM) malformations. The objective of this study is to describe the clinical patterns in the neonate that allow us to differentiate sporadic CMs from those associated with other vascular malformations.

METHODS

A case-control study was performed in neonates with CM located in the trunk, followed at our institution between 2008-2018. The patients were divided into two groups: A (cases: CM associated with VM or LM) and B (controls: sporadic CM without associated malformations). Demographic and clinical variables collected in the clinical history were evaluated (color, location, multifocality, bilaterality, position with respect to the vascular axis and involvement of the midline).

MAIN RESULTS

Thirty-eight patients were included (18 cases and 20 controls) without differences in gender and age. In group A, the totality of patients presented CM with uniform color and lateral location (p <0.001). In this group bilateral and multifocal involvement was lower than in group B, without significant differences between both groups. The distribution of CMs in group A was always parallel to the vascular axis and the midline was always respected, without observing these characteristics in the group B (p <0.001).

	CM associated with VM/LM (n=18)	Sporadic CM (n=20)	P (Chi2)	OR 95%
Age (months)	2.6 ± 0.5	3.2 ± 0.6	0.84	-
Gender • Women • Men	 8 (44%) 10 (56%)	 9 (45%) 11 (55%)	0.97	1.02 (0.28-3.68)
Bilaterality	2 (11%)	4 (20%)	0.45	-
Absence of involvement of mid-line	18 (100%)	3 (15%)	<0.001	-
Location lateral	18 (100%)	0	<0.001	-
Multifocality	6 (33%)	8 (40%)	0.67	0.75 (0.20-2.83)
Parallel position to the vascular axis	18 (100%)	0	<0.001	-
Uniform colour	18 (100%)	0	<0.001	-

CONCLUSIONS

The presence of a CM in the trunk of a neonate with uniform color, lateral location, parallel position to the vascular axis and absence of involvement of the midline, should make us suspect other underlying vascular malformations, which should be studied with complementary tests.

GE202: INTRAGASTRIC VERSUS INTRAVESICAL MONITORING OF INTRA-ABDOMINAL PRESSURE IN INFANTS WITH GASTROSCHISIS

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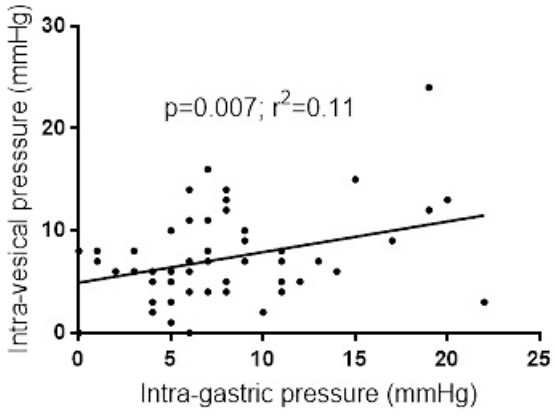
AIM
Intra-abdominal pressure measurement in neonates with gastroschisis has been proposed as being useful in guiding speed of visceral reduction and identifying risk of compartment syndrome. Intra-abdominal pressure is typically recorded using an indwelling urinary catheter. This is an invasive technique, not routinely used in clinical care, and carries a risk of catheter-related complications. Since neonates with gastroschisis all have an indwelling nasogastric tube, we aimed to assess whether intragastric pressure reliably reflects intravesical pressure in this population.

METHODS
In an ethically-approved (NRES) prospective study, serial paired measurements of intragastric and intravesical pressure were recorded during staged silo reduction of simple gastroschisis. A standardised technique for pressure measurement was used. Linear regression was used to determine the relationship between intragastric and intravesical pressure.

RESULTS
Total five infants were enrolled: median gestational age 35 weeks (range 34–37) and median birthweight 2609g (1660-3535g). A total of 61 sets of paired measurements were available (median of 12 [range 9–17] per infant). Maximum pressure recorded was 24 mmHg, minimum 0 mmHg and no infant had clinical suspicion of compartment syndrome. Although linear regression revealed a statistically significant relationship (Figure 1; p=0.007) between intravesical and intragastric pressure, the strength of this association was weak (r^2 = 0.11). Further analysis of pairs of pressure measurements in individual infants revealed a statistically significant relationship in just one of the five infants.

CONCLUSION
Intragastric pressure is not a reliable surrogate for intravesical pressure and therefore not a useful non-invasive monitoring technique in this context.

Figure 1



GE203: SEGMENTAL REVERSAL OF THE DISTAL SMALL INTESTINE IN A SHORT BOWEL SYNDROME MODEL – IS THERE A LIMIT OF LENGTH?

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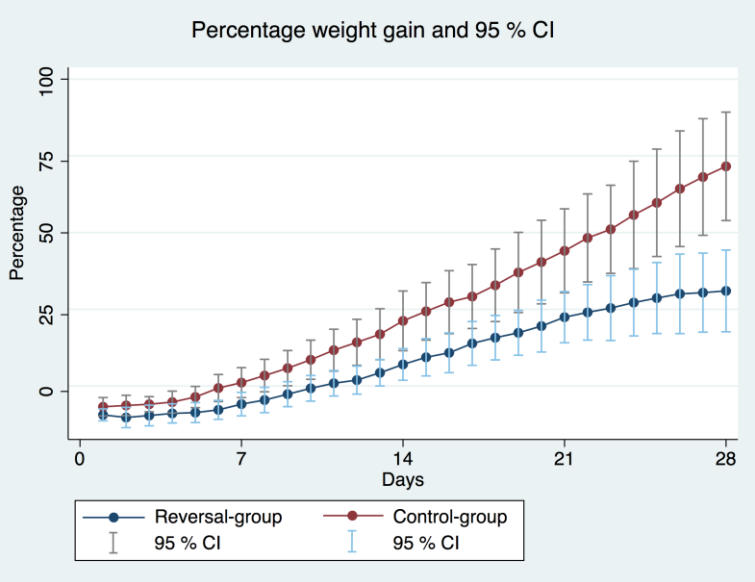
AIM OF THE STUDY
The aim was to investigate whether reversal of a 25 cm long segment of the distal small intestine could improve weight gain in a short bowel syndrome model in piglets.

METHODS
To induce the short bowel syndrome model 70% of the distal small intestine was resected in 24 piglets. The distal 25 cm of the remnant small intestine was reversed in half of the animals, and the other half served as control. The animals were followed with daily weight for 28 days and euthanized. Gastrointestinal transit time was estimated with radio-opaque pellets added to food six and eight hours prior to euthanasia. Blood samples were withdrawn on day 0 and day 28 to determine plasma levels of Glucagon-like peptide-2 (GLP-2) and Glucose-dependent Insulinotropic peptide (GIP).

MAIN RESULTS
The distal small intestine reversal-group had a mean weight gain of 5.26 ± 3.39 kg, which was significantly ($p<0.05$) lower than the control group which gained 11.14 ± 3.83 kg. Histological analysis showed that the reversal-group had greater muscular thickness five cm orally from the first of the two anastomoses, and the control group had greater villus height and crypt depth five cm anally to the anastomosis ($p<0.05$). GLP-2 and GIP levels increased significantly in the control group, compared with levels at day 0. Gastrointestinal transit time showed no significant differences.

CONCLUSIONS
Reversal of a 25 cm segment had a negative effect on the weight gain, GLP-2 and GIP levels in this short bowel syndrome model.



GE204: NATIONAL BIRTH PREVALENCE AND MORTALITY OF GASTROSCHISIS

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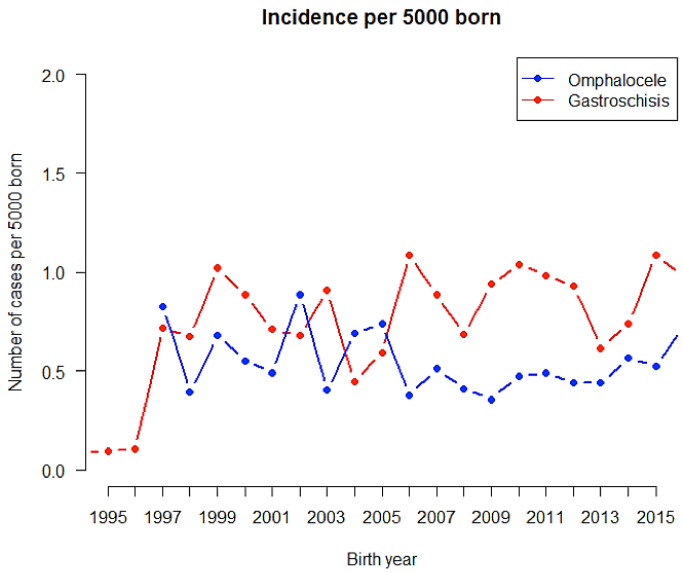
AIM OF THE STUDY
The diagnose of Gastroschisis is most common prenatal and some of the fetus are aborted due to this discovery. It has although been reported an increased incidence of Gastroschisis. The aim of this study was to examine the national Swedish birth prevalence, rate of termination of pregnancy and mortality among these patients.

METHODS
A Swedish nationwide, population-based, case-control cohort containing all children born in Sweden between 1/1 1997 till 31/12 2016 was used for this study. The cases were identified in the Swedish National Patient Register and data on diagnosis and mortality were collected from the Swedish National Patient Register, the Swedish Medical Birth Register and the Swedish Causes of Death Register. Ten age- and sex-matched controls were randomly selected among children without Gastroschisis in the cohort.

MAIN RESULTS
The study included 361 cases of Gastroschisis and 3610 controls. 55% were of male gender. The birth prevalence of Gastroschisis was 0.8 in 5 000 live births. The rate of termination of pregnancy was 19,6 % in the Gastroschisis group. The 1 year mortality rate was 12 individuals (3.3 %) among the cases and 5 (0.1%) among the controls (p>0.01). In Figure 1 the birth prevalence is shown.

CONCLUSION
This national population-based study shows a Swedish birth prevalence of Gastroschisis of 0.8/5000 live births. In almost 1 out 5 prenatally diagnosed Gastroschisis the pregnancy will be terminated.



GE205: PREOPERATIVE PARENTAL ANXIETY AND ITS CORRELATION WITH PEDIATRIC DISTRESS

Rosalie Kühlmann, Claudia Keyzer-Dekker, Lonneke Staals, René Wijnen, Monique van Dijk
Erasmus MC, Rotterdam, Netherlands

AIM OF THE STUDY
Preoperative anxiety is common, to pediatric patients facing surgery but to their parents as well, and can be associated with negative side-effects perioperatively. Mutual anxiety has been reported between children and their parents. We aimed to identify the levels of preoperative parental anxiety, and to evaluate mutual anxiety.

METHODS
Eligible were parents of infants and toddlers who had surgery for inguinal hernia, undescended testicles or hypospadias. Parental preoperative anxiety was tested with the Amsterdam Preoperative Anxiety and Information Scale (APAIS) as well as the short forms of the Spielberger State Trait Anxiety Inventory (STAI). Behavior of children was assessed with the COMFORT-Behavior assessment. Regression analysis investigated effect of medical and surgical history, type of surgery, age of child and parental gender on preoperative parental anxiety. Ethical approval was obtained.

MAIN RESULTS
188 pairs of children (90% male, median age 6.9 months) and their accompanying parent (n=128 (68%) mother) participated in the study. 36.7% (n=68) of parents were anxious according to the APAIS. Mean APAIS scores from mothers were statistically significantly higher than from fathers, respectively 11.5 (4.1) and 10.0 (3.6); p=0.021. Multivariable regression analysis showed that no medical history, younger pediatric age and maternal gender increased parental anxiety, together predicting 8.2% of the variance. No correlations were seen between anxiety of parent and child.

CONCLUSIONS
Over one-third of parents experience significant anxiety regarding surgeries in their children. No mutual anxiety was observed between parents and children. Effort needs to be taken to reduce preoperative parental anxiety.

GE206: TESTICULAR TORSION: HOW LONG IS THE GOLDEN TIME FOR DETORSION?

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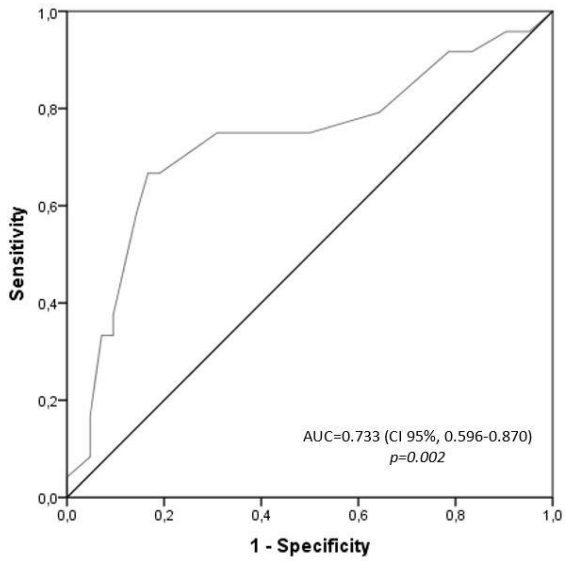
AIM OF STUDY
Testicular torsion (TT) remains the most common cause of gonadal loss in adolescents. It is generally accepted that a 4-8 hours window from the onset of symptoms to surgery is the limit to save a testis. We aimed to assess a threshold of duration of symptoms that predicts testicular outcome.

METHODS
Review of patients who presented TT between 2015 and 2018. Demographics, clinical presentation, initial approach and follow-up evaluation were collected. Receiver operator characteristics (ROC) curves were constructed. The optimal cutoff point was defined as the value of the maximum Youden-Index.

MAIN RESULTS
Ninety-five patients were included. Eighty-four (group A) underwent orchiopexy and 11 orchiectomy (group B). Fifty-five patients from group A had long-term follow-up; 42 (group A1) presented normal testis and 13 (group A2) atrophic gonads. The duration of symptoms of group A1 (median [IQR], 6.5 [5;12] h) was significantly (p=.002) lower than group B1 (B plus A2) (12 [7.5;72] h). ROC analysis (figure) of duration of symptoms demonstrated good discriminative value; the optimal cutoff point to predict gonadal loss was 17 hours (NPV, 70%; PPV, 81%).

CONCLUSION
Despite the mandatory expeditious diagnosis and treatment, the outcome of TT seems to shift significantly much later than 4-8 hours. In the present study the cutoff was settled at 17 hours, a duration till which a favorable outcome is expected; nevertheless beyond this threshold a substantial proportion of testis will be rescued.



Cutoff-point value	Sensitivity	Specificity	Younden index
17	66.7%	83.3%	0.500

GE207: DUPLICATION OF LOWER URINARY TRACT: DO THE EXISTING CLASSIFICATIONS EMBRACE ALL TYPES OF ANOMALIES?

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PURPOSE
to study all cases of lower urinary tract duplications and to define the diagnosis according to the existing classifications.

MATERIALS AND METHOD
From 1990 to 2018, 48 patients, aged 2 month to 11 years, with duplication of the lower urinary tract were evaluated (15 female, 33 male). All patients underwent a thorough urological examination. In a retrospective study, patients were divided into two groups according to existing classifications.

RESULTS
Group 1: Thirty patients with duplication of the urethra (4 female 26 male). Twenty two boys were categorized by Effman (1976), type: IA - 4 , IIA1 - 1, IIA2 - 17 (Y-type 10).

Group 2: Eighteen patients with bladder duplication (11 female, 7 male). Diagnosis by Abrahamson classification (1961): Complete reduplication - 6, Incomplete reduplication - 4, complete sagittal septum-2, incomplete sagittal septum - 1.

We were unable to define the diagnosis using existing classifications in thirteen cases (27). Four boys with diphalia, four girls with duplication of the urethra, four patients diagnosed duplex bladder with exstrophy of accessory bladder, one had incomplete bladder duplication due to the presence of a bone fragment between the bladders.

CONCLUSION
Thus, the existing classifications don’t embrace all types of this anomaly and it is difficult to be guided by them when choosing surgical treatment tactics. Therefore, it is desirable to create a classification reflecting the functional state of the lower urinary tract. We propose to classify this anomalies into 3 groups: the group without functional disorders, with functional disorders and the group in the complex of severe malformation.

GE208: BIOFEEDBACK IN TREATMENT OF LOWER URINARY TRACT SYMPTOMS IN CHILDREN

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INTRODUCTION
Bladder and bowel dysfunction describes a large spectrum of lower urinary tract symptoms along with fecal elimination issues. The aim of the study was to analyze the effects of biofeedback treatment in children with lower urinary tract symptoms (LUTS).

METHOD
After obtaining Ethics board approval, a prospective study analyzing the effects of biofeedback treatment was conducted in patients with LUTS. Questionnaires and voiding diaries were collected prior to, and after the treatment, and uroflow-EMG performed. Patients were followed daily for two weeks throughout the treatment. After that the data from voiding diaries, questionnaires and uroflow-EMGs were analyzed.

RESULTS
Total of 74 children were referred for biofeedback treatment. Thirty-five patients had isolated dysfunctional voiding (DV), sixteen had overactive bladder (OAB), five had giggle incontinence, 7 had difficulties starting a void and 15 had OAB and DV. Total of 58 patients had their symptoms ameliorated. The analyzed data showed no measurable improvement in 4 patients, even though they reported a personal impression of an improvement. Twelve patients without the positive effect of the therapy were immature and/or non-cooperative. In 12 patients with OAB and incontinence, the symptoms disappeared by the end of the treatment. Three patients with giggle incontinence had an improvement of their symptoms after biofeedback treatment.

CONCLUSION
Biofeedback is a very useful tool in treatment of lower urinary tract symptoms in pediatric population. Although the main indication for initiating this therapy is dysfunctional voiding, the study showed an improvement of symptoms in patients with other LUTS as well.

GE209: ULTRASOUND- AND SCINTIGRAPHY-BASED RISK SCORING – A VALUABLE TOOL TO REDUCE THE AMOUNT OF VOIDING CYSTOURETHROGRAMS IN CHILDREN WITH PRENATAL HYDRONEPHROSIS

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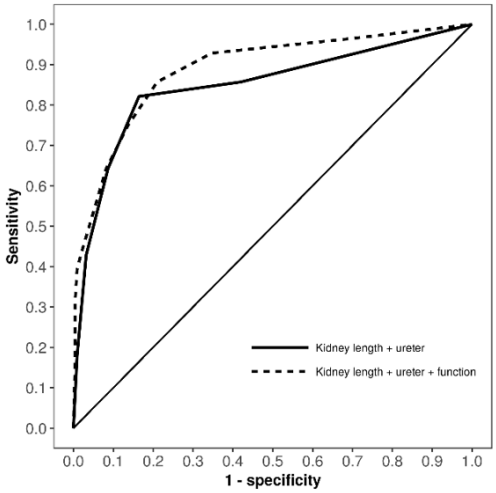
OBJECTIVE
To evaluate whether presence of high-grade (4–5) vesicoureteral reflux (VUR) can be predicted from renal ultrasonography and renal scintigraphy (MAG3/DTPA/DMSA) findings in patients with prenatal hydronephrosis and perform voiding cystourethrograms (VCUGs) only on high-risk patients.

METHODS
The renal ultrasonography, renal scintigraphy, and VCUG images of all infants between 2003 and 2013 at our institution due to prenatally detected hydronephrosis were re-analyzed. Patients with complex urinary tract anomalies were excluded.

RESULTS
One-hundred-twenty-fife patients, (76% males) were included. Twenty-eight (11%) renal units (RUs) of total 247 RUs had high-grade VUR. In multivariate analysis, a visible ureter (OR 19.263; CI 7.095–57.590, p<0.001) and declined renal length (OR 2.144; CI 1.111–4.225, p=0.024) in ultrasonography and reduced differential renal function (DRF) (OR 2.841; CI 1.501-5.660, p=0.002) in scintigraphy predicted high-grade VUR. Renal length and DRF were categorized in three different categories and the cut-offs were analyzed with multivariate analysis. A three-grade risk score for high-grade VUR was developed based on the ultrasonography and scintigraphy findings and the patients were categorized into low-, intermediate-, and high-risk groups. The presence of high-grade VUR was 2.3% in the low-risk, 22.2% in the intermediate risk, and 75.0% in the high-risk group. The sensitivity and specificity for detecting high-grade VUR were 86% and 79%, respectively.

CONCLUSIONS
In patients with prenatal hydronephrosis, a visible ureter and reduced renal length in ultrasonography and reduced DRF in scintigraphy are significant risk factors for high-grade VUR. An ultrasonography- and scintigraphy-based risk scoring would probably reduce the proportion of unnecessary VCUGs.



Receiver operating characteristic (ROC) curves for the risk factors (reduced renal length in standard deviation scale and visibility of the ureter in the renal ultrasonography imaging and reduced differential renal function (DRF) in renal scintigraphy) for grade 4-5 vesicoureteral reflux in patients with antenatally detected hydronephrosis.

Voiding cystourethrogram results were categorized as grade 4–5 and grade 0–3 vesicoureteral reflux. In the ROC analysis, the area under the curve (AUC) for the model where both DRF and the renal ultrasonography findings were included was 0.89 (95% CI 0.81–0.96). In the model where DRF is not included the AUC is 0.85 (95% CI 0.76-0.94).

GE210: PREDICTION OF COMPLICATED ACUTE APPENDICITIS FROM ROUTINE LABORATORY PARAMETERS IN CHILDREN

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INTRODUCTION
Antibiotics has appeared as an alternative to surgical treatment of uncomplicated acute appendicitis (UCAA), especially in adult patients.

AIM
Our aim was to study whether a complicated acute appendicitis (CAA) could be predicted by routine lab tests in children.

METHODS
Appendectomy cases from the years 2015-2018 were analysed retrospectively. Patients were grouped according to their histological results as UCAA (simple, phlegmonous) and CAA (gangrenous, perforated). White blood cell count (WBC), neutrophil ratio (Neu) and CRP level were studied. Fisher's exact test and ROC curves were used for statistical analysis.

RESULTS
We were able to include 585 (354 boys and 231 girls) patients, 478 to the UCAA and 104 to the CAA group. The average age at the surgery was 11.0 (SD 3.5) years. Specificity of WBC and Neu was low. Analysing the ROC curve of CRP level, there was an ideal CRP cutting point at 42mg/l, with sensitivity of 78.64% and specificity of 82.15%. For simplicity, we considered 40mg/l CRP value as a cutting point for further statistical analysis. Patients above 40mg/l of CRP level had 14.58 times more chance to have complicated appendicitis ($p<0.0001$).

DISCUSSION

CAA cases can be predicted with good specificity and sensitivity by measuring of CRP level. These patients may be ranked ahead waiting for surgery during on-call time. If there will be an opportunity to treat UCAA cases by antibiotics instead of acute surgery, CRP alone will be helpful in selection of suitable patients.

GE211: NEUTROPTHIL-TO-LYMPHOCYTE RATIO AS AN INTRAABDOMINAL ABSCESS PREDICTOR IN ACUTE APPENDICITIS IN CHILDREN

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AIM OF THE STUDY

Intra-abdominal abscess (IAA) is a serious complication of acute appendicitis (AA), which frequently appears in AA with peritonitis. The neutrophil-to-lymphocyte ratio (NLR) is an inflammatory marker that has been related to the development of peritonitis; however, its diagnostic role in predicting IAA has not been evaluated. This is the first study that analyzes the utility of NLR as a predictor of IAA in AA.

METHODS

Retrospective observational study in patients treated of AA in our institution during 2017-2018. Patients aged under 5 years or with incomplete analytical determinations at hospital admission (blood count, C-reactive protein and fibrinogen) were excluded. Demographic, analytical variables and the development of postsurgical IAA were analyzed. NLR was calculated by dividing the absolute number of neutrophils by the absolute number of lymphocytes. The sensitivity and specificity of the different analytical parameters were determined as predictors of IAA by means of ROC curves.

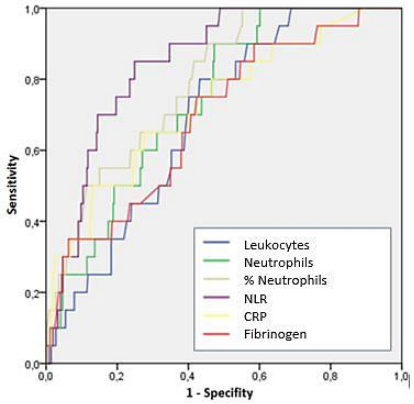
RESULTS

A total of 388 patients were included (mean age 10.5±2.9y). Twenty of them developed IAA (5.2%). NLR presented an area under the curve (AUC) of 0.85, significantly higher than the determination of leukocytes (AUC 0.69, p<0.001), neutrophils (AUC 0.74, p<0.001), fibrinogen (AUC 0.68, p<0.001) and C-reactive protein (AUC 0.73, p<0.001). We estimated the optimal cut-off point of NLR>10.5 with a sensitivity of 85% and a specifity of 75.2%.

CONCLUSIONS

NLR allows predicting the development of IAA better than any other analytical parameter. It can be useful in cases of complicated appendicitis as a predictor of worst postoperative course.

	Area under ROC curve
Leukocytes	0.69
Neutrophils	0.74
Neutrophils %	0.79
N-L Ratio	0.85
C-reactive protein	0.73
Fibrinogen	0.68



GE212: ENDOLOOP VERSUS ENDOSTAPLER FOR APPENDIX STUMP CLOSURE IN CHILDREN WITH COMPLICATED APPENDICITIS: RESULTS OF A MULTICENTRIC INTERNATIONAL SURVEY

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AIM OF THE STUDY

The study aimed to compare endoloop (EL) vs endostapler (ES) for appendix stump closure during laparoscopic appendectomy (LA) in children with complicated appendicitis.

METHODS

The records of 708 patients (463 boys and 245 girls with an average age of 9.8 years), who underwent LA for complicated appendicitis in 5 international centers of Pediatric Surgery over a 5-year period, were retrospectively reviewed. The appendix was perforated with localized peritonitis in 470 cases while a diffuse peritonitis was found in 238 patients. EL was used in 374 cases (G1) whereas ES was adopted in 334 cases (G2). All patients received the same antibiotic protocol (cephalosporine + metronidazole) postoperatively.

MAIN RESULTS

Five conversions to open surgery were reported in G1 (1.3%) and 4 in G2 (1.1%) (p=0.55). No significant difference between G1 and G2 in regard to: operative time (p=0.20), analgesic requirement (p=0.55), hospitalization (p=0.41), duration of antibiotics (p=0.41). Intra-abdominal abscess [G1:12.5%; G2:9.5%] and small bowel obstruction (SBO) rates [G1:2.1%; G2:0.5%] were significantly higher in G1 compared to G2 (p=0.0001). Re-operations and readmission rate was significantly higher in G1 (3.7%) compared to G2 (0.5%) (p=0.0001). The average cost of supplies for LA was significantly higher in G2 (€ 915.60) compared to G1 (€ 578.36) (p=0.0001).

CONCLUSIONS

Although ES is more expensive compared to EL, our results suggested that appendix stump closure should be performed using ES rather than EL in selected complicated appendicitis since its use reported a lower incidence of intra-abdominal abscess and SBO and lower re-operations rate.

GE213: LEADLESS PACEMAKER IMPLANTATION: FIRST PEDIATRIC COHORT

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AIM OF THE STUDY
Permanent cardiac pacing implantation remains the only effective solution for patients with symptomatic bradycardia and heart block. Progressively, devices have shrunk in size and grown in their sophistication. The implanted leadless pacemaker device eliminates the need for a subcutaneous pocket and insertion of a pacing lead, thereby eliminating an important source of complications associated with traditional pacing systems while providing similar benefits. The aim of our study is to present the first worldwide pediatric case series.

METHODS
Prospective observational study that included 6 children with an indication for single-chamber pacemaker implantation between July 2018 and January 2019.The device is contained in a hermetically sealed capsule whose volume is 0.8cm and weight 2.0g. It has an active fixation mechanism composed of 4 electrically inactive nitinol tines, designed to attach to the heart at the right ventricular site through a specific introducer sheath for femoral access of 27 Fr. In smaller patients we had used a transjugular access. Demographic, clinical, surgical and radiological variables were assessed.

MAIN RESULTS
Successful implantation was accomplished in 6 patients (3 femoral and 3 jugular access). All had registered asystole between 10 s and 2 min. Mean age was 7-years (r=3-14), mean weight: 17.2 kg (r=13-37). The correct position of the pacemaker in the right ventricle was ensured. Length of stay was 24h. There were no complications. The mean followup was 5-months. Sensing and pacing parameters were stable both at implantation and during the follow-up.

CONCLUSIONS
Implantation of leadless pacemakers is feasible and safe in pediatric population.

GE214: MANAGEMENT OF APPENDICEAL MASS AND ABSCESS IN CHILDREN; EARLY APPENDECTOMY OR INITIAL NON-OPERATIVE TREATMENT? A SYSTEMATIC REVIEW

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AIM OF THE STUDY

To evaluate the effect of early appendectomy compared to non-operative treatment for children with appendiceal mass or abscess on the rate of complications.

METHODS

A systematic review of the literature was conducted according to the PRISMA guidelines. A literature search was performed in Pubmed and EMBASE. The search was finished on 14th of July 2018. All (randomized) controlled trials and cohort studies, reporting on the outcomes of early appendectomy and non-operative treatment for children (0-17 years old) with appendiceal mass or abscess were eligible for inclusion. Two authors independently selected eligible articles, extracted data and assessed methodological quality according to the Cochrane tool for assessing risk of bias and ROBINS-1. Outcomes of interest were the percentage of children experiencing any complication within one year after treatment, length of stay, and quality of life.

MAIN RESULTS

15 of the 5898 articles screened were eligible for inclusion, including 361 (early appendectomy) and 805 (non-operative treatment) children. Large heterogeneity was found between the studies regarding definitions of appendiceal mass/abscess, (non-)operative treatment, and complications. Therefore a meta-analysis of the results was not performed. Main results are displayed in Table 1. Percentage of children experiencing complications ranged from 7-69% and 0-29% for early appendectomy and non-operative treatment, respectively.

CONCLUSIONS

Evidence for the optimal treatment strategy for appendiceal mass or abscess in children is scarce. Non-operative treatment appears to be associated with less complications and advantageous in terms of quality of life and length of hospital stay compared to early appendectomy.

Table 1. Main results

First author (year)	Study design	Number of patients		Total complications (% of children experiencing at least one complication)		Mean length of stay (days)		Quality of life (PIP difficulty 12 weeks)	
		EA	NOT	EA	NOT	EA	NOT	EA	NOT
Bufo (1998)	Retrospective cohort	46	41	10 (21%)	2 (5%)	6.2	4.3	-	-
Emil (2007)	Retrospective cohort	44	32	3 (7%)	2 (6%)	6.9	7.2	-	-
Erdogan (2005)	Retrospective cohort	14	15	5 (26%)	0 (0%)	8.7	8.9	-	-
Furuya (2015)	Retrospective cohort	15	16	13 (40%)	0 (0%)	26.2	28.6	-	-
Gahukamble (1993)	Retrospective cohort	7	59	4 (57%)	5 (9%)	10.8	10.2	-	-
Gastrin (1969)	Retrospective cohort	19	23	9 (47%)	6 (26%)	15.2	14.2	-	-
Gillick (2001)	Retrospective cohort	16	211	2 (13%)	23 (11%)	6	3.3	-	-
Handa (1997)	Retrospective cohort	8	6	5 (63%)	0 (0%)	15.4	17.3	-	-
Puri (1981)	Retrospective cohort	16	38	11 (69%)	11 (29%)	32.3	26.5	-	-
Roach (2007)	Retrospective cohort	60	32	5 (8%)	0 (0%)	7.1	8.3	-	-
Samuel (2002)	Prospective cohort	34	48	4 (12%)	0 (0%)	4.8	13.2	-	-
Schurman (2011)	Randomized Controlled Trial	20	20	-	-	-	-	47.57 ± 4.84	69.00 ± 5.24
St Peter (2010)	Randomized Controlled Trial	20	20	4 (20%)	5 (25%)	6.5	6.7	-	-
Surana (1995)	Retrospective cohort	9	189	1 (11%)	27 (14%)	-	-	-	-
Tanaka (2016)	Prospective cohort	33	55	7 (21%)	1 (2%)	12.9	13.0	-	-

EA= early appendectomy; NOT= non-operative treatment; PIP = Pediatric inventory for parents

GE215: INVESTIGATION OF BOSTERAN EFFECTS ON LUNG CONTUSION EXPERIMENTAL STUDY

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AIM OF THE STUDY
We aimed to evaluate the effects of bosentan on lung injury.

METHODS

5 randomized groups created. AK3: lung contusion (3 days) (n=8), AK-B3: lung contusion+3 days bosentan (n=8), AK7: lung contusion+7 days bosentan (n=8), C: control (n=6). Lung contusion created by dropping weight unilaterally. Bosentan was given at dosage of 100 mg/kg/day. On 3rd and 7th days, alveolar edema, congestion, leukocyte infiltration, fibrosis, iNOS, eNOS, apoptosis, MDA, SOD and NO levels were studied.

MAIN RESULTS

The values of alveolar edema, congestion and leukocyte infiltration in all groups were higher than control ($p<0,05$). The same values were lower in AK-B3 and AK-B7 than AK3 and AK7 ($p<0,05$). The development of fibrosis was demonstrated in AK7 and AK-B7; no effect of bosentan was found on fibrosis ($p>0.05$). In all groups, iNOS and eNOS levels were higher than control ($p<0,05$). These levels did not differ between bosentan and non-bosentan groups ($p>0,05$). There was no significant difference between the NO measurements of the groups ($p>0.05$). Recovery in MDA and SOD values was found in groups treated with bosentan ($p<0.05$). TUNEL study showed higher levels of apoptosis in AK3 and AK7 than control ($p<0,05$). TUNEL scores of AK-B3 and AK-B7 were significantly lower than AK3 and AK7 ($p<0,05$).

CONCLUSIONS

It was found that bosentan prevents tissue damage by inhibiting acute inflammatory response and reduces oxidative stress indirectly. It was also found to reduce apoptosis. It is effective and clinically applicable agent to prevent secondary injuries due to lung contusion.

GE216: LAPAROSCOPIC VERSUS OPEN PEDIATRIC INGUINAL HERNIA REPAIR: STATE OF THE ART COMPARISON AND FUTURE PERSPECTIVES FROM A META-ANALYSIS

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AIM
Laparoscopic inguinal hernia repair in children is increasingly performed as it allows contralateral inspection and potentially results in shorter operation time and less complications. Level 1a evidence regarding the superiority of laparoscopic versus open hernia repair is lacking.

METHODS
A systematic literature search was performed querying PubMed, Embase, MEDLINE and the Cochrane Library databases. Randomized controlled trials (RCTs) comparing laparoscopic with open hernia repair in children (<18 years) were considered eligible, without year and language restrictions. The Cochrane Risk of Bias tool was used for quality assessment of the included RCTs. Data were pooled using a random effects model.

MAIN RESULTS
Eight RCTs (n=733 patients; age range: 4 months-16 years) were included in this meta-analysis. Laparoscopic (LH) and open (OH) hernia repair was performed in 375 and 358 patients, respectively. LH resulted in shorter bilateral operation time (Weighted Mean Difference (WMD) -5.41 min, 95%CI[-6.34,-4.48];p<0.001), prolonged hospital stay (WMD 1.50 hours, 95%CI[-0.87,2.12]; p<0.001) and less metachronous contralateral inguinal hernias (MCIH)(odds ratio 0.10, 95%CI[0.02,0.58];p=0.01). Unilateral operation time, operative and postoperative complications, time to recovery and recurrence rate did not differ, though large heterogeneity exists between the included studies. Indifferent findings tend to show a trend towards less postoperative pain and better cosmesis following laparoscopic repair.

CONCLUSIONS
No definite conclusions to decide on the superiority of one of either treatment strategies can yet be drawn from the available literature. Laparoscopic repair might be indicated in children with bilateral inguinal hernia or high risk on MCIH development.

GE301: SURGICAL MANAGEMENT OF OESOPHAGEAL ACHALASIA IN PAEDIATRICS: A SYSTEMATIC REVIEW

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AIM OF THE STUDY
There are no evidence-based guidelines on the surgical management of oesophageal achalasia (OA) in children. This can be a challenging condition with significant physical and psychological morbidity. Our aim was to identify the most common management modalities and their outcomes.

METHODS
A systematic review was performed through a literature search of healthcare databases in accordance with PRISMA guidelines, aiming at identifying paediatric series discussing the diagnosis and management of OA. Duplicates, case series with<10 patients and follow-up of<1 year were excluded. The included papers were analysed for diagnostic methods, primary treatment method, complications, follow-up duration, outcome measures recorded and outcome.

MAIN RESULTS
Data from 33 papers for 577 children treated for OA was analysed. Eleven mentioned multiple management modalities. In summary, 25 described Heller's oesophagomyotomy (HM) , 13 balloon dilatation (BD) and 6 per-oral oesophageal myotomy (POEM). Mean follow-up was 43.7 months (12-180). Outcome measures were heterogeneous. However, analysis of reported success showed a mean success of 75.4% for HM ($P=1.05X10^{-6}$), 51.6% for BD (P=0.36) and 99.3% for POEM (P=0.001). Reported complications were 4.6% for HM, 1.3% for BD and 3.1% for POEM. Further interventions were required for 10.9% of HM, 62.3% of BD and 0% of POEM patient groups.

CONCLUSIONS
Methods of diagnosis and measures of successful outcomes were heterogeneous, limiting the strength of evidence. HM showed superior short-term success rates to BD. POEM is a promising modality but requires investment in equipment and training. Information about sustainability of response and long-term outcomes is lacking.

GE302: ESOPHAGEAL ANASTOMOTIC STRICTURE SEVERITY INCREASES LINEARLY WITH ANASTOMOTIC TENSION – AN EXPERIMENTAL STUDY IN SWINE

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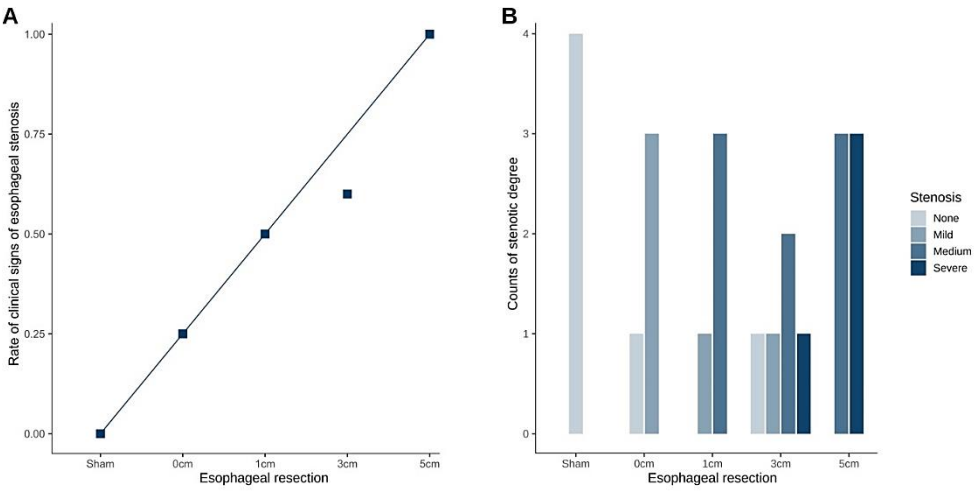
PURPOSE
Esophageal anastomotic strictures occur more often when the ends are brought together under tension, but this association has not been evaluated in detail. We aimed to systematically study these issues in a swine model, because the porcine esophagus is structurally similar to that of humans.

METHODS
We divided the esophagus in three-week old Pietrain piglets (5.2kg±0.45kg) at the carinal level and re-anastomosed it directly (n=4), and after resections of one (n=4), three (n=5), and five (n=6) centimeters. These were compared to shams (n=4) [permit: G-17-1-033]. The piglets were followed for two weeks for clinical signs of esophageal stenosis and euthanized after esophageal fluoroscopy. We calculated the lateral esophageal stricture index and conducted a semi-quantitative assessment of stricture severity using the explanted esophagus. Categorical data were analyzed using the Chi-squared-test for trend and numerical data with linear regression in a blinded fashion.

RESULTS
Regurgitation of fodder followed an increasing linear trend from Shams to five centimeter resection lengths (*P*=0.0005; figure A), as did stricture severity (*P*=0.0035; figure B). Moreover, resection length also was a predictor of fluoroscopic esophageal stenosis: While stenosis was absent in Shams, the stenotic index increased linearly from 0.51 (95% CI: 0.38–0.65) with 0.05 (95% CI: 0.003–0.09) per additional centimeter resection (F(1,17)=4.992; *P*=0.0392).

CONCLUSIONS
The severity of esophageal strictures in piglets increases clinically, macroscopically and radiologically with the amount of anastomotic tension. Since humans and swine share anatomically similar esophagi, we assume this relationship to be present in humans, too.



GE303: EFFECTIVENESS OF A NEW PROTOCOL OF ANTIBIOTHERAPY IN NON-COMPLICATED ACUTE APPENDICITIS IN CHILDREN

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Hospital Universitario La Paz, Madrid, Spain

AIM OF THE STUDY

In June 2018 our service implemented a new protocol for the management of uncomplicated acute appendicitis (AA) according to the recommendations of the Preventive Medicine service of our institution, modifying both the antibiotic and the days of treatment. The objective of this work is to compare the effectiveness of the new protocol with the previous one.

METHODS

The clinical charts of children with AA treated between January 2017 and December 2018 were retrospectively analyzed. Demographic data, mean hospital stay, days of intravenous and total antibiotic therapy, and postoperative complications were collected. Patients were classified according to the type of appendicitis (phlegmonous or gangrenous) and the received antibiotic protocol (A: presurgical single dose of amoxicillin-clavulanic acid in phlegmonous, and 5 days in gangrenous and B: Metronidazole and Gentamicin 24 hours in phlegmonous and 7 days in gangrenous). All patients were initially treated with intravenous antibiotic, changing to oral administration after adequate tolerance in both protocols.

Main results:

A total of 495 (354 phlegmonous and 141 gangrenous) patients were included, without differences in age and gender. Patients treated with protocol A had a significant decrease in average hospital stay and days of antibiotic treatment when compared with those treated with protocol B, without statistically significant differences in the rate of postoperative complications between both protocols (TABLE 1).

CONCLUSIONS

Our management protocol for acute appendicitis has allowed us to reduce our average hospital stay and the days of intravenous antibiotic therapy without increasing complications, considering it an effective alternative.

Type of AA	Phlegmonous (n = 354)		p	Gangrenous (n= 141)		p
	Protocol A (n= 110)	Protocol B (n= 244)		Protocol A (n=45)	Protocol B (n= 96)	
Age	10.56±2.87	10.30±3.17	0.56	10.0±2.42	9.71±3.07	0.58
Gender • Men • Women	71 (64.5%) 39 (35.5%)	152 (62.3%) 92 (37.7%)	0.68	25 (55.6%) 20 (44.4%)	58 (60.4%) 38 (39.6%)	0.58
Mean hospital stay (days at hospital)	1.29±0.84	2.01±0.80	<0.01	3.76±6.28	5.21±2.16	<0.01
Days with intravenous antibiotic	0.29±0.86	1.21±0.68	<0.01	3.49±2.15	4.38±1.14	<0.01
Total days with antibiotic	0.47±1.41	1.36±1.45	<0.01	5.73±1.63	7.72±2.08	<0.01
Complication rate (%)	1.8%	3.3%	0.96	20.0%	18.8%	0.86

GE304: UNUSUAL INDICATIONS FOR MULTIVISCERAL TRANSPLANTATION

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INTRODUCTION
Improved outcomes prompt the use of intestinal transplantation for complex intestinal pathologies not included in the classical list of indications. Our aim was to analyze our experience in some of these unusual indications.

METHODS
Retrospective review of our historical series of intestinal/multivisceral transplants (1999-2018). We compared the outcomes of the unconventional cases to those performed following the classic indications (short gut syndrome, motility disorders, untreatable diarrheas), considering $P<0.05$ statistically significant.

RESULTS
We reviewed 107 transplants, finding 9 unusual cases among them: 3 benign cystic retroperitoneal teratomas with SMA lesion during surgery, 1 myofibroblastic tumor involving main vessels, 1 multifocal postext IV hepatoblastoma with tumoral portal thrombus reaching beyond the spleno-mesenteric junction, 1 vascular accident in an appendectomy, 1 Martínez-Frias syndrome, 1 mitochondrial disease and 1 Alagille syndrome with ileal atresia.

Eight patients received a multivisceral graft and 1 an isolated small bowel. Neither surgical/infectious complications nor rejection and retransplantation rates showed statistical differences with our main series. PTLD (11%) and GVHD (22%) were also similar. Overall patient survival was 82% with a mean follow-up of 7 years [0-13], with no differences between the groups.

CONCLUSION
Multivisceral transplant is a safe therapeutic option in challenging cases in which the integrity of the intestine is affected. According to our study, these transplants present the same prognosis as the classic indications. Emerging indications, like the 9 cases reported in this work, would appeared in the future. Intestinal transplantation should be at least considered to treat these patients attended in IRUs.

GE305: COMPARING PARENT AND CHILD ONLINE HEALTH INFORMATION SEEKING BEHAVIOURS IN ELECTIVE PEDIATRIC SURGICAL SITUATIONS

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AIM
Little is known of how children seek health information. This study evaluates online health information(OHI) seeking behaviours in children undergoing major elective surgical procedures and compares responses within parent-child dyads.

METHODS
With institutional approval, we prospectively surveyed parents of children admitted to our institution for major elective operations between November 2017-November 2018, using convenience sampling. Patients aged 12 years and above were also invited. Each respondent completed an anonymized modification of a previously published survey on Internet usage. Chi-squared tests were used for categorical data, with significance at P-value<0.05.

RESULTS
Ninety-one parents and 19 patients (median age 15 years, range 12-18) responded, with 13 parent-child pairs. Daily Internet access was reported by 84 (93%) parents and 18 (95%) children but OHI was sought in 77% of parents and 74% of children. Six (32%) children could not name their admitting condition, compared to 10 (11%) parents. Nine (50%) children consulted family and friends for information compared to 27 (30%) parents. Parents were more likely to access hospital websites (n=15, 44%) compared to no children (p=0.01), while most children (n=7, 70%) accessed non-health websites (e.g. Wikipedia). In the 13 parent-child pairs, only one parent accurately assessed what their child understood of their condition. Most patients (63.6%) did not understand the aspects of their condition that their parents deemed important.

CONCLUSIONS
This study highlights the differences in parental and child behaviours. Children are equally important to include when counselling. Surgeons can guide both parties to reliable Internet sources for health information.

GE306: RISK SCORE FOR PRENATALLY DIAGNOSED CONGENITAL DIAPHRAGMATIC HERNIA BASED ON ULTRASOUND FINDING

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AIM OF THE STUDY
To establish and validate a versatile risk score for fetuses with congenital diaphragmatic hernia (CDH) using findings of prenatal ultrasound only.

METHODS
Using logistic regression analysis, we created a prediction model and weighted scoring system using the derivation data set and calculated odds ratio of unsatisfactory prognosis (death within 90 days of life or hospitalization over 180 days). Prenatal ultrasound findings were used as predictors. Database of our study group was used as derivation (2011-2016) and validation data set (2006-2010).

MAIN RESULTS
Five adverse prognostic factors were identified: observed/expected lung area to head circumference ratio (o/eLHR) of < 25% {adjusted odds ratio (OR) 3.4, 95% confidence interval (CI) 1.7-6.6, p<.001}, liver-up (adjusted OR 3.0, 95% CI 1.5-5.9, p=.002), thoracic stomach (adjusted OR 2.8, 95% CI 1.1-7.6, p=.038), right CDH (adjusted OR 4.9, 95% CI 1.1-21.2, p=.035) and severe malformation (adjusted OR 9.6, 95% CI 3.7-24.7, p<.001). The prediction model of unsatisfactory prognosis was obtained based on adjusted OR of these factors. Then, a risk score system was developed, and patients were classified into 3 risk categories. The rates of unsatisfactory prognosis in low-, intermediate- and high-risk groups were 13%, 57% and 100% in derivation data set (p<0.001), and 11%, 40%, and 88% in validation data set (p < 0.001), respectively. The C statistics of the model were 0.83 and 0.80 in the derivation and validation data sets, respectively.

CONCLUSIONS
Presented simple risk score was capable of predicting prognosis well.

	Point	Score
o/eLHR <25%	1	___
Liver-up	1	___
Thoracic stomach	1	___
Right CDH	2	___
Severe malformation	3	___
Score		___

Stratification
Low-risk: 0-1
Intermediate-risk: 2-4
High-risk: 5-8

GE307: A DELPHI ANALYSIS TO REACH CONSENSUS ON PREOPERATIVE CARE IN INFANTS WITH HYPERTROPHIC PYLORIC STENOSIS

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AIM
Infantile hypertrophic pyloric stenosis (IHPS) is a common surgical condition in infants which can lead to metabolic alkalosis and subsequently, if uncorrected, to respiratory complications. Laboratory values prior to pyloromyotomy and fluid resuscitation policies are subject of debate. The objective of this study was to formulate a recommendation about preoperative care in infants with IHPS using the Delphi technique.

METHODS
The *RAND/UCLA Appropriateness Method* was used to reach international expert consensus of pediatric surgeons, pediatric anesthetists and pediatricians. Statements on type and frequency of blood sampling, on required serum concentrations before pyloromyotomy and on intravenous fluid therapy were rated online by using a 9-point Likert scale. Consensus was present if the panel rated the statement either appropriate/obligatory (panel median 7-9) or inappropriate/unnecessary (panel median 1-3) without disagreement according to the IPRAS formula.

MAIN RESULTS
33 and 29 panel members completed the first and second round respectively. Consensus was reached in 55 out of 69 statements (80%). The panel recommended the following laboratory tests and corresponding cut-off values prior to pyloromyotomy: pH ≤7.45; base excess ≤3.5; bicarbonate <26 mmol/L; sodium ≥132 mmol/L; potassium ≥3.5 mmol/L and chloride ≥100 mmol/L. Isotonic crystalloid (Ringer lactate or normal saline) with 5% dextrose and 10-20 mEq/L potassium should be used for fluid resuscitation.

CONCLUSION
Consensus is reached in an expert panel regarding the assessment of metabolic derangements at admission, which serum concentrations are required before pyloromyotomy and the intravenous fluids required to correct dehydration in infants with IHPS.

GE308: DUODENAL ATRESIA – IS LAPAROSCOPY WORTH THE PAIN?

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AIM
Duodenal atresia (DA) repair can be performed open or laparoscopically. We aimed to determine potential benefits of laparoscopic repair regarding enteral feeding, postoperative pain, length-of-stay and complication rate.

METHODS
In a single-centre retrospective cohort study, we compared neonates with isolated DA operated open versus laparoscopically from 2010 to 2018. No transanastomotic tubes were used and anastomoses were created in a transverse-to-longitudinal side-to-side fashion in all cases. Early feeding policy was adopted for all cases. Statistical comparison was performed using the Mann-Whitney test or Fisher's exact test where appropriate.

RESULTS
The 39 patients analysed were similar regarding body weight, gestational age, and proportion of patients with Trisomy 21. Median follow-up was 23 months. Median anaesthetic duration was 29 minutes shorter in the open group (p=0.02; 179 minutes vs 208 minutes); In 4 (22%) out of 18 laparoscopic patients, the procedure was converted to open. Opioid medication was stopped at a median of 2.5 days after laparoscopy while 4 days after open repair (p=0.04, Fig 1). Duration of parenteral nutrition was 40% shorter (7 vs 11.5 days, p=0.04 Fig 1) and time to full feeds 50% shorter (7 vs 14 days, p=0.01 Fig 1) in the laparoscopic group. Outcomes such as length-of-stay, sepsis, occurrence of strictures or adhesions were comparable.

CONCLUSION
Although anaesthetic time was slightly longer, patients undergoing laparoscopic DA repair benefited from shorter need of opioid medication shorter duration of parenteral nutrition and earlier full enteral feeds.

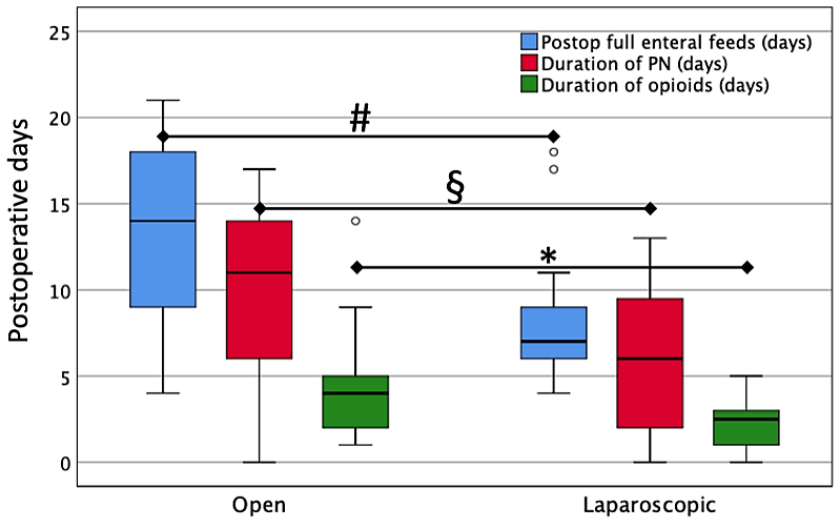

Figure 1. **Earlier enteral feeding, shorter parenteral nutrition and shorter need for opioids after laparoscopic repair.** Comparing open to laparoscopic repair, median time to full enteral feeds was 14 and 7 days, respectively (**#** p=0.01). Median duration of postoperative parenteral nutrition (PN) was 11.5 days compared to 7 days for open or laparoscopic repair, respectively (**§** p=0.04). Median duration of opioids for open or laparoscopic group was 4 days or 2.5 days, respectively (***** p=0.04). [Boxes are interquartile ranges 1 ù to 3, the whiskers mark maximum and minimum values, "o" reflect outliers.]

GE309: HISTOPATHOLOGICAL STUDY OF ANORECTAL MALFORMATIONS: POSSIBILE IMPLICATIONS IN MUSCLE TISSUE DEVELOPMENT

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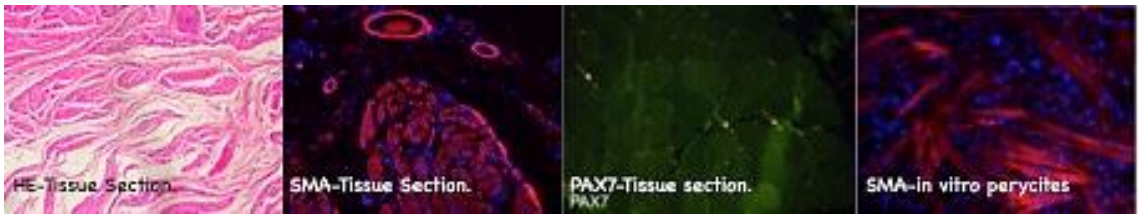
AIMS OF THE STUDY
Histological and immune-histological characterization of ARMs fistulas, testing a tissue immunofluorescence protocol. Samples were studied for striated muscle tissue and muscle stem cells; we also investigated the myogenic potential of fistula-derived pericytes, in order to understand their possible role in the development of anal muscle complex.

METHODS
Morphological hematoxylin-eosin study was performed on 16 ARMs fistulas samples (10 paraffin and 6 fresh samples harvested during PSARP interventions), comparing “high” versus “low” ARMs. Fistulas were also studied by immunofluorescence with different tissues markers, including Pax7 for satellite cells. Pericytes were isolated from fresh fistulas samples and their myogenic potential was tested *in vitro*.

RESULTS
We detected different types of coating-epithelium and alteration of muscular layers in all samples; absence of ganglion cells was found in 10 out of 16. No differences in ganglion cell count or thickness of nerve trunks was seen between different ARMs-types. No satellite cells (Pax7+) were observed, except for a single sample comprisinf few marginal muscle striated cells. In vitro, fistula-derived pericytes could be differentiated in smooth but not in striated muscle cells.

CONCLUSIONS
Limited data on tissue analysis from ARMs can be found in the literature. Our study confirms main abnormalities to the connective tissue, ganglion cell representation and abnormal nerve trunk. Not histological differences were observed between ARMs-fistulas with different prognosis. No skeletal muscle precursor cells were found in the fistulas, suggesting that there is a little or not potential for the development of striated muscle that could contribute to continence.



GE310: 1-YEAR OUTCOMES OF PRIMARY VS MULTIPLE-STAGED REPAIR IN ANORECTAL MALFORMATIONS: A LARGE NATIONAL COHORT

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AIM OF THE STUDY
To compare 1-year outcomes between primary vs multiple-staged (three operations with colostomy) repair in anorectal malformations (ARMs).

METHODS
Retrospective analysis of national administrative database (HES-Hospital Episode Statistics) including all the neonates born with ARMs in England between 2003 and 2015. Ethical approval was granted before data collection. Main outcomes were: 1-year mortality, post-operative readmissions and reoperations. Secondary outcomes: cumulative length of hospital stay (cLOS) and hospital volume-outcome relationship. Chi-squared and logistic regression were used to assess the associations between procedure type and outcomes. All the models were adjusted by age at admission, gender, ethnic group, socioeconomic deprivation, year of admission, and comorbidities, using an α level of 0.05.

MAIN RESULTS
1312 neonates with ARMs were treated in specialist paediatric centres, of whom 203 (15.5%) had a primary repair. 1-year mortality was 8.3% with no difference based on the type of repair. Overall readmission rate was 55.9%. Primary repair was associated with lower probability of readmission (ARM:OR=0.62, 95%CI=0.43-0.90,p=0.011) compared with multiple-staged. Reoperation rates were not different between primary vs multiple-staged (20.2% vs 22.4% respectively,p=0.48). cLOS was higher for patients with multiple-staged repair (mean=42.9d, SD=64.4) compared with primary repair (mean=34.4d, SD=45.4). There were no significant differences in 1-year outcomes between patients treated in low volume (<37cases/year) and high volume (>55cases/year) specialist centres. Adjusted logistic regression model showed significant less readmissions and cLOS for the primary repair (Table).

CONCLUSIONS

Primary repair of ARMs is associated with better 1-year outcomes compared to multiple-staged repair. These findings can guide future recommendation on when to perform a primary repair.

Table - Adjusted logistic regression analysis to define relationships among variables, readmission and cumulative length of stay.

	Readmission			cLOS†		
	Odds Ratio	95% CI*	P value Chi-Square	Odds Ratio	95% CI*	P value Chi-Square
Age			0.864			0.060
<1 day	1.00			1.00		
1-6 days	1.05	0.73-1.50	0.792	0.85	0.60-1.20	0.363
7-28 days	1.22	0.58-2.58	0.598	1.80	0.95-3.40	0.072
Sex			0.124			0.037
Male	1.00			1.00		
Female	0.69	0.48-0.99	0.042	0.80	0.57-1.14	0.219
Ethnic group			0.082			0.640
Carstairs index			0.813			0.904
Year of admission			0.532			0.960
2003	1.00			1.00		
2004	0.86	0.38-1.98	0.726	1.02	0.46-2.24	0.971
2005	1.03	0.43-2.52	0.941	1.14	0.50-2.59	0.762
2006	1.56	0.63-3.86	0.340	0.97	0.44-2.15	0.939
2007	0.64	0.28-1.47	0.297	0.70	0.29-1.67	0.417
2008	1.14	0.46-2.80	0.778	0.77	0.33-1.80	0.549
2009	0.78	0.35-1.73	0.542	1.14	0.52-2.51	0.746
2010	1.68	0.71-3.94	0.237	1.08	0.50-2.31	0.845
2011	0.68	0.31-1.49	0.332	1.12	0.52-2.42	0.764
2012	0.82	0.36-1.84	0.626	1.08	0.50-2.34	0.848
2013	1.12	0.49-2.53	0.795	0.90	0.41-1.96	0.787
2014	0.93	0.40-2.16	0.864	0.69	0.30-1.60	0.387
2015	1.15	0.49-2.68	0.754	1.24	0.57-2.70	0.596
Comorbidity			0.810			0.705
Yes	1.00			1.00		
No	0.95	0.60-1.49	0.810	1.08	0.74-1.57	0.705
Procedure type			0.011			<0.001
Multiple-stage	1.00			1.00		
Single-stage	0.62	0.43-0.90	0.011	0.33	0.21-0.51	<0.001
Hospital volume			0.473			0.914
Low	1.00			1.00		
Medium	0.75	0.42-1.33	0.320	0.92	0.56-1.53	0.747
High	0.71	0.42-1.23	0.222	0.99	0.61-1.59	0.954

* CI= confidence interval
† cLOS: cumulative length of hospital stay

GE311: 1-YEAR OUTCOMES OF PRIMARY VS MULTIPLE-STAGED REPAIR IN HIRSCHSPRUNG'S DISEASE: A LARGE NATIONAL COHORT

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AIM OF THE STUDY
To compare 1-year outcomes between primary vs multiple-staged (three operations with colostomy) repair in Hirschsprung's disease (HD).

METHODS
Retrospective analysis of national administrative database (HES-Hospital Episode Statistics) including all the neonates born with HD in England between 2003 and 2015. Ethical approval was granted before data collection. Main outcomes: 1-year mortality, post-operative readmissions and reoperations. Secondary outcomes: cumulative length of hospital stay (cLOS) and hospital volume-outcome relationship. Chi-squared and logistic regression were used to assess the associations between procedure type and outcomes. All the models were adjusted by age at admission, gender, ethnic group, socioeconomic deprivation, year of admission, and comorbidities, using an α level of 0.05.

MAIN RESULTS
1333 neonates with HD were treated in specialist paediatric centres, of whom 874 (65.6%) had a primary repair. 1-year mortality was 2.8% (n=37) with no differences based on the type of repair. Overall readmission rate was 74.8%. Primary repair was associated with lower probability of readmission (OR=0.08, 95%CI=0.06-0.11,p<0.001) compared with multiple-staged. Reoperation rates were not different between primary vs multiple-staged (14.2% vs 16.6% respectively, p=0.718). cLOS was similar in the two groups (primary:mean=40.9d, SD=53.8; multiple-staged:mean=40.5d, SD=52.5). There were no significant differences in 1-year outcomes between patients treated in low volume (<37cases/year) and high volume (>55cases/year) specialist centres. Adjusted logistic regression model showed significant less readmissions and cLOS for the primary repair (Table).

CONCLUSIONS

Primary repair in HD is associated with better 1-year outcomes compared to multiple-staged repair. These findings should guide clinical practice whenever a neonate is able to tolerate wash-out before surgery.

Table. Adjusted logistic regression analysis to define relationship among variables, readmission and cumulative length of stay.

	Readmission			cLOS†		
	Odds Ratio	95% CI*	P value Chi-Square	Odds Ratio	95% CI*	P value Chi-Square
Age			0.510			0.572
<1 day	1.00			1.00		
1-6 days	0.66	0.33-1.34	0.252	1.31	0.79-2.18	0.294
7-28 days	0.66	0.29-1.49	0.317	1.31	0.72-2.37	0.378
Sex			0.997			0.928
Male	1.00			1.00		
Female	1.02	0.67-1.54	0.942	1.06	0.78-1.46	0.699
Missing	>999.99		0.987	<0.01		0.982
Ethnic group			0.963			0.026
Carstairs index			0.779			0.963
Year of admission			0.950			0.643
2003	1.00			1.00		
2004	1.41	0.51-3.93	0.513	1.45	0.71-2.99	0.312
2005	1.42	0.53-3.77	0.484	0.97	0.47-1.98	0.929
2006	1.05	0.41-2.67	0.922	0.85	0.41-1.75	0.651
2007	0.95	0.36-2.48	0.912	1.02	0.49-2.14	0.959
2008	1.13	0.40-3.17	0.822	1.06	0.49-2.31	0.883
2009	1.10	0.42-2.86	0.853	1.12	0.55-2.31	0.752
2010	1.63	0.59-4.56	0.348	0.78	0.37-1.62	0.499
2011	1.01	0.40-2.52	0.990	0.80	0.39-1.64	0.549
2012	0.81	0.33-2.00	0.652	0.80	0.39-1.65	0.543
2013	0.86	0.34-2.15	0.740	1.01	0.49-2.08	0.970
2014	1.11	0.43-2.90	0.831	0.64	0.30-1.36	0.245
2015	1.60	0.55-4.63	0.390	0.64	0.29-1.40	0.259
Comorbidity			0.345			
Yes	1.00			1.00		
No	1.17	0.85-1.62	0.345	0.89	0.68-1.17	0.389
Procedure type			<0.001			<0.001
Multiple-stage	1.00			1.00		
Single-stage	0.08	0.06-0.11	<0.001	0.38	0.28-0.52	<0.001
Hospital volume			0.844			0.170
Low	1.00			1.00		
Medium	0.87	0.50-1.50	0.606	0.75	0.50-1.12	0.156
High	0.96	0.58-1.60	0.872	0.70	0.49-1.02	0.062

* CI= confidence interval.
† cLOS: cumulative length of hospital stay

GE312: EFFECTIVENESS OF SHORT - TERM ANTIBIOTIC THERAPY IN MANAGEMENT OF ACUTE APPENDICITIS IN CHILDREN

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AIM OF THE STUDY
To determine effectiveness of short-term antibiotics therapy in management of acute appendicitis in children.

METHODS
Retrospective review of 120 consecutive patients operated of appendectomy with TULAA technique for uncomplicated appendicitis. 26 patients were excluded due to conversion. Patients were divided into two groups: children who received only a preoperative dose of antibiotic (Group A – Short) vs children who received both preoperative and postoperative doses of antibiotics (Group B – Long). In both groups surgical time (ST), length of stay (LS), short and middle-term post-operative complications (PC) were evaluated.

MAIN RESULTS
94 children (Group A 31, Group B 63); mean age 10 y.o. High prevalence of male in group A (Fisher Test 0.069). Adherences of the appendix were present in 38% group A vs 54% in group B. Mean ST (min): 51 group A vs 57 group B (p=0.05092). Mean LS: 4 days in both groups. PC: 1 patient in group A vs 2 patients in group B showed surgical incision infection. No infective abdominal collections in all patients at mid-term follow up (ultrasound control).

CONCLUSIONS
Conclusive demonstration of effectiveness of the short prophylaxis in TULAA uncomplicated appendectomy would need a randomized controlled trial: these preliminary data point to a similar efficacy of the two strategies. In view of the increasing risk of antimicrobial resistance, the short-term prophylaxis represents an efficacious option. Interestingly, appendicitis in female seems to lead surgeon to a more aggressive long-term antibiotic strategy.

GE313: DOES LAPAROSCOPIC FUNDOPLICATION REDUCE PROTONIC PUMP INHIBITORS (PPI) USE IN CHILDREN?

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AIM OF THE STUDY
To evaluate the use of PPI therapy after laparoscopic fundoplication (LF) in a pediatric population.

METHODS
Retrospective review of all children operated of LF at our Institute from January 2010 to December 2018. Stratification in two groups: neurological-impaired children (NI) and non-neurological-impaired (N-NI). In both groups evaluation of surgical outcome by: 1) PPI use after surgery 2) endoscopic (EGDS) and 3) histological findings at follow-up.

RESULTS
We reviewed 45 children (Group NI 37, Group N-NI 8). Surgical techniques of LF: 37 Nissen, 4 Dor, 4 Toupet. 15 patients lost at follow up, 3 deaths in NI group. All children underwent to outpatient visit and EGDS control with biopsies. Median length of follow-up 1 year [0.5 – 2.7]. PPI use was 40% at last follow-up visit. No statistically significant differences were found comparing NI and N-NI in term of PPI use (Chi square test, p-value 0.20). Moreover PPI use after surgery was not statistically related to EGDS or histological findings of esophagitis (Chi square test, p-value 0.76).

CONCLUSIONS
In our series incidence of PPI use after LF was 40%, within the range seen in literature. LF should not be performed with the expectation that all patients will no longer need antireflux medications. Functional studies after LF, as pH-MII, and quality of life evaluation may provide guidance to stratify patients who actually need PPI. Moreover, PPIs are often abused and mislabeled by other clinicians who share the care of these children, especially in NI patient group.

GE314: CONGENITAL INTRATHORACIC STOMACH CAN BE SAFELY MANAGED LAPAROSCOPICALLY

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AIM OF THE STUDY
Congenital intrathoracic stomach (CIS) is an uncommon paediatric surgical diagnosis where the entire stomach lies within the chest due to extreme hiatal herniation. We reviewed our recent experience with this condition.

METHODS
Eleven year (2007-2018) retrospective review of children with a diagnosis of CIS was performed. Patient demographics, presentation, imaging and management were assessed. Results are expressed as median (range).

RESULTS
Eleven patients (6 girls, 5 boys) were identified with onset of symptoms at 2 (0-26) months of age. Presenting symptoms were vomiting (8/11), respiratory issues (4/11) and failure to thrive (2/11). Two patients had Marfan's syndrome. All had diagnosis confirmed on upper gastrointestinal contrast study. All were corrected laparoscopically with hiatus hernia repair and fundoplication (age at surgery 10.5 (1.5-34.5) months). There were no conversions to open surgery. Five patients (45.5%) had a concurrent gastrostomy aged 6.5 months or younger at surgery. Enteral feeds were commenced on post-operative day one in 82%, the rest on day two. Follow-up duration was 7 (0-95) months with all on full enteral feeds (3 via gastrostomy). There was 1 recurrence (9%) 6 months post-operatively (without gastrostomy) which was re-operated laparoscopically.

CONCLUSION
This is the largest reported series of children with CIS. All could be managed laparoscopically with no conversions and a low recurrence rate. Gastrostomy may protect against recurrence.

ON01: PRENATALLY DIAGNOSED SACROCOCCYGEAL TERATOMA: THE RESULTS OF A NATIONWIDE SURVEY

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AIM OF THE STUDY
The outcome of prenatally diagnosed sacrococcygeal teratoma (SCT) is relatively unknown and mainly studied in patients treated in single tertiary referral centers. We assessed the mortality in all prenatally diagnosed fetuses with SCT including the incidence of pregnancy termination, prenatal and neonatal death and its potential risk factors.

METHODS
All fetuses with SCT diagnosed from 1999 to 2018 in the Netherlands were retrospectively included. Potential risk factors for mortality (tumor volume index (TVI), vascularization, polyhydramnion, morphology, fetal hydrops and cardiomegaly) were examined.

MAIN RESULTS
Fifteen of 85 (17.6%) pregnancies were terminated before gestational age (GA) 23 weeks and two (2.4%) fetuses died in utero, both at GA 25 weeks. Seven of the remaining 68 neonates died within 24 hours after birth (8.2%) because of heart failure and hemorrhagic shock. Potential risk factors for mortality were fetal hydrops (OR: 25, CI; 2.1-250, p=0.001) and cardiomegaly (OR: 11,11 CI: 2.43-50, p: <0.001). TVI was significantly higher in fetuses with poor prognosis at a GA of 24 weeks (OR: 2.667, CI: 1.09-6.52, p=0.009). Mortality was not significantly associated with tumor vascularization, polyhydramnion and tumor morphology.

CONCLUSIONS
The overall mortality of prenatally diagnosed SCTs of 28.2% was relatively high. In a large proportion, the pregnancy was actively terminated. Potential risk factors for poor outcome were fetal hydrops, cardiomegaly and increased TVI at GA 24 weeks.

ON02: THE INTERNATIONAL NEUROBLASTOMA SURGICAL REPORT FORM: A JOINT SIOPEN-COG-GPOH INITIATIVE

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INTRODUCTION & AIM
High-risk neuroblastoma (NBL) necessitates multimodal treatment with induction chemotherapy, surgical resection, high-dose chemotherapy & radiation therapy, completed by biological therapy. The surgical resection of NBL is often a demanding procedure due to the tumor's tendency to encase vital blood vessels, risking loss of vital organs. To be able to compare surgical procedures in multicenter studies, it is important to report and register surgical procedures in a standardized and extensive manner. Additionally, standardized description will help further surgical and radiation planning.

METHODS
This novel "INSRF" is the result of a joint effort of the surgical committees of SIOPEN, COG & GPOH to create an international structured and detailed surgical case report form that also incorporates the reporting of potential complications.

MAIN RESULTS
The first part of the INSRF includes coded patient & study details and describes the nature, approach and result of the surgical procedure, with a description of the involvement of the tumor in different anatomical regions.
The second part of the INSRF extensively describes the vascular involvement of specific vessels including the degree of resection and potential injury caused. Organ involvement, resection and macroscopic tumor residue are also recorded, in concordance with preoperative image-defined risk factors. In part 3 & 4, detailed intraoperative complications as well as postoperative complications are recorded using the Clavien-Dindo classification.

CONCLUSION

By standardized reporting of NBL surgery, the new INSRF will improve the collection of surgical data & facilitate comparison across international borders. The INSRF also aims to be useful for the reporting of other neuroblastic tumors.

ON03: INTRACELULAR LOCALIZATION OF BETA-CATENIN EXPRESSION PLAYS A KEY ROLE ON THE OUTCOME OF HEPATOBLASTOMA PATIENTS

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AIM
Wnt/Beta-catenin pathway plays an essential role in liver development and regeneration. Abnormal activation in this pathway leads to development of hepatoblastoma (HB). Although its importance has invoked attention, its prognostic role has not been previously established. We aimed to evaluate the significance of intracellular localization of beta-catenin (BC) expression in the outcome of hepatoblastoma patients.

METHODS
Medical records of HB patients between Jan 2004-Nov 2018 were reviewed. Demographics, radiological images, PRETEXT classifications, vascular involvement, risk groups, chemotherapy responses, recurrence and survival rates were analysed. Patients were grouped according to intracellular localization of BC expression by immunohistochemistry as being Cytoplasmic or Nuclear. Fisher Exact Test was used for statistical analysis, and “p” value <0.05 was considered significant.

RESULTS
There were 41 patients. Thirteen patients were excluded for unavailability of records in 4, negative/unclear BC expressions in 7, and fatality due to chemotherapy toxicity in 2. Cytoplasmic expression of BC was observed in 16 patients whereas 12 patients displayed Nuclear expression. Demographics were similar in both groups. Cytoplasmic BC expression was associated with poor chemotherapy response (<50% reduction in size; 9/15 vs 0/12; p=0.0046) and increased vascular involvement (11/14 vs 3/12; p=0.016) requiring more extensive surgeries (10/14 vs 3/12; p=0.047).

CONCLUSION

To our knowledge, this is the first study emphasizing the importance of intracellular localization of BC expression that may provide insights for the management of HB as cytoplasmic immunohistostaining of BC protein is associated with poorer outcome, need for extensive surgeries and probably earlier consideration for transplantation.

ON04: SURGICAL MANAGEMENT OF SYNCHRONOUS PULMONARY METASTASES IN PATIENTS WITH HEPATOBLASTOMA: ONE OR TWO STAGE APPROACH

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AIM OF THE STUDY
Pulmonary metastases occur in approximately 20% of patients with hepatoblastoma (HB). The aim of this study was to describe the surgical management of pulmonary metastases remaining after chemotherapy and to determine the long-term outcome.

METHODS
All patients with an HB referred to our institution, a pediatric liver disease and transplantation center between 1996 and 2015 were included in this study. The patients requiring a liver transplantation were excluded of our study.

MAIN RESULTS
A total of 116 cases with HB were enrolled. 30 patients (25,9%) had pulmonary metastases at diagnosis. All patients received an induction chemotherapy according to the SIOPEL protocol. 13 (11,2%) presented residual pulmonary nodules; at diagnosis, all these patients had bilateral pulmonary metastases and the median size of the largest nodule was 9,5mm (8-15,5). 9 patients underwent pulmonary metastasectomy by thoracotomy before (5 patients) or after (4 patients) partial hepatectomy (PH). 2 patients had a left thoracotomy before (1 patient) or after (1 patient) PH and the resection of the remaining nodules in the right lung by a trans-diaphragmatic approach during the PH. In 2 patients, pulmonary nodules were removed only by a trans-diaphragmatic approach during the PH. There was no surgical complication related to the pulmonary metastasectomy. 8 of these 13 patients with metastasectomy were long-term survivors.

CONCLUSIONS
Several surgical procedures are possible to completely resect pulmonary lesions persistent after induction chemotherapy and to improve long term survival. A multicentral trial will be helpful to determine which surgical strategy is the best.

ON05: MANAGEMENT AND RESULTS OF PROPHYLACTIC THYROIDECTOMY IN MEN 2 SYNDROME

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AIM OF THE STUDY
The objective of this study is to evaluate outcomes of prophylactic thyroidectomies in patients with MEN 2 syndrome.

METHODS
A retrospective study was designed, including all patients with MEN 2 syndrome who underwent prophylactic thyroidectomy between 1997-2018. Demographics, gene mutation, postoperative complications and histologic findings were registered.

MAIN RESULTS
25 patients were included (24 with MEN 2A and 1 with MEN 2B) with a median age at surgery of 5.2 years (range 2.8 to 13.6 years). Histological alterations were found in 88% (22) of patients. Familiar history was present in all but 5 patients. 1 patient had a concomitant Hirschsprung disease. 8 patients had a RET mutation ranked as Moderate Risk (American Thyroid Association): median age at surgery was 5 years (range 2.8 to 13.6 years), and histological findings were C-cell hyperplasia in 6 patients and no alterations in 2 patients. 13 patients had a High Risk mutation; median age at surgery was 5 years (range 3 to 11 years) and histological findings were: 1 medullary thyroid cancer, 3 microcarcinoma, 8 C-cell hyperplasia and no alteration in 1 patient. The highest risk mutation was found in one patient with no familiar history; age at surgery was 10.7 years and a medullary thyroid carcinoma was found. Median hospital stay was 1 day (range 1 to 4 days). There were no permanent complications. No symptomatic hypocalcemia was registered.

CONCLUSIONS
Early prophylactic thyroidectomy is a safe procedure without permanent complications and decreases the oncological risk in MEN 2 patients.

ON06: THE VALUE OF DIFFUSION-WEIGHTED MRI TO PREDICT VIABLE AREAS OF NEUROBLASTOMA BEFORE SURGICAL RESECTION: A PILOT STUDY

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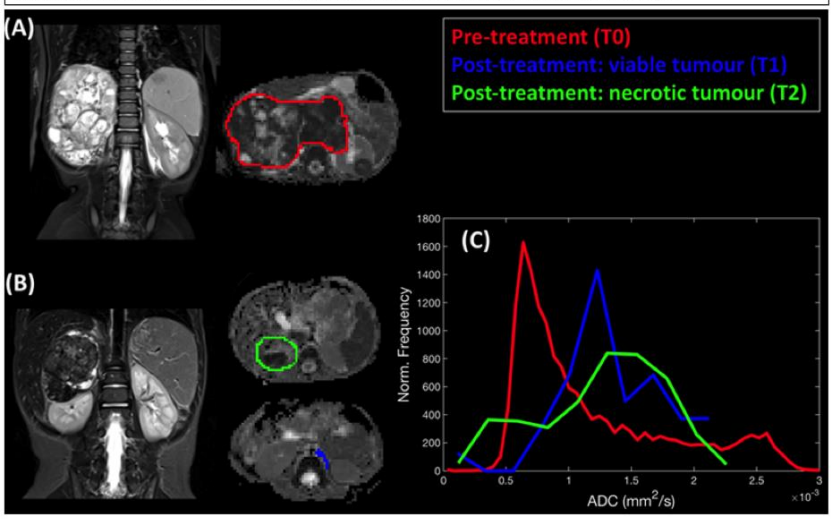
AIM OF THE STUDY
to explore whether apparent diffusion coefficient (ADC) values, obtained with diffusion-weighted (DW) magnetic resonance imaging (MRI) before and after multimodal treatment for stage 4 neuroblastoma (NBL), can predict areas of viable and non-viable tumour before surgical resection.

METHODS
We selected four cases of intrabdominal NBL with both viable and non-viable components on histology and studied clinical notes, MRI images and histology. We compared ADC values at diagnosis (T0) with areas of viable (T1) and non-viable tumour (T2) after treatment. Fractional enhanced maps and ADC values were produced within different areas based on the histology report of the surgical resection. Two-sided Wilcoxon rank sum test was used for comparisons ($P<0.05$ was significant). Local R&D approval obtained.

MAIN RESULTS
A positive shift in ADC values was seen following treatment in all the cases (median ADC pre-treatment=$8.8\times10^{-3}mm^2/s$, median ADC post-treatment = $1.4\times10^{-3}mm^2/s$, $p<0.001$) indicating a reduction in cellular density following chemotherapy. Areas of necrotic tumour had higher ADC values than viable tumour although a larger cohort is needed to validate their statistical significance (median ADC (T2)=$1.52\times10^{-3}mm^2/s$, median ADC (T1)=$1.38\times10^{-3}mm^2/s$). Figure 1 shows ADC mapping and distribution to stratify viable and necrotic tumour following treatment.

CONCLUSIONS This pilot study shows that DW-MRI could be a promising non-invasive tool to guide surgeons to resect only the areas of viable tumour identified preoperatively. A larger cohort is needed to validate this data, however this methodology could significantly reduce complexity, time and morbidity of surgical resection in neuroblastoma.

Figure 1 Pre- and post-treatment images from a representative patient. (A) Pre-treatment coronal STIR image (top left) with axial ADC map (right). The area of the primary tumour analysed is outlined in red. (B) Post-treatment coronal STIR image (bottom left) with two axial ADC maps (right). The upper ADC map illustrates the primary tumour (green outline), which following surgical removal and histological analysis was shown to be pre-dominantly necrotic. The lower ADC map illustrates the location of an additional tissue sample removed during surgery (blue), which showed poorly differentiated neuroblastoma (viable tumour). (C) Graphic representation of changes in the ADC values.



ON07: GASTRIC TUMORS IN CHILDREN – A HIGH RISK OF REPEATED RECURRENCE

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AIM OF THE STUDY
To present an analysis of the surgical management and prognosis of pediatric patients treated in our department for gastric tumors.

METHOD
A retrospective study of patients with primary gastric tumors treated between 1993-2018.

MAIN RESULTS
The study group comprised 8 patients, 5 girls and 3 boys, who were diagnosed with gastric tumors at an average age of 10.4 years (1 day – 15.4 years). The chosen surgical approaches were Billroth type I procedure in 5 patients and tumor excision in 3 patients. Average tumor diameter was 8.5 cm. Histology showed GIST in 4 patients and one of each of schwannoma, myofibroblastic tumor, hamartoma and teratoma with microscopically clear margins in 6 patients. There were no postoperative complications noted. Repeated local recurrence occurred in 3 patients (1x myofibroblastic tumor, 2x GIST), who consequently underwent 3, 4 and 6 reoperations. Additional chemotherapy and Glivec therapy were indicated in two of these patients. One patient metastasized into the liver and due to inoperability was successfully managed by ligation of hepatic arteries. The patient also suffered from lung hamartoma which was resolved by lobectomy. Overall survival rate was 100% with a mean follow-up of 8.6 years (7 months – 25.5 years). One patient is lost to follow up.

CONCLUSIONS
Primary gastric tumors are extremely rare in children and represent a management challenge. Local repeated recurrence remains frequent even after complete resection and may necessitate multiple surgeries, therefore patients require a life-long follow-up.

ON08: SURGICAL ASPECTS, VIOLATIONS AND OUTCOMES OF WILMS TUMOR - A MULTICENTER STUDY IN A RESOURCE LIMITED COUNTRY

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AIM OF THE STUDY
To evaluate short term outcomes of patients with unilateral wilms tumor at a developing country and to analyze surgical violations (SV), and its impact on prognosis.

METHODS
Retrospective review for 37 cases presented to our hospitals and underwent tumor nephrectomy from January 2016 to December 2018. All participating centers adopt children's oncology group protocol. The SV were analyzed by chi-square test and logistic regression. Overall survival (OS) and event free survival (EFS) were estimated by Kaplan-Meier method.

MAIN RESULTS
There were 12 (32.4%), 11 (29.7%), 10 (27%) and 4 (10.8%) stage I, II, III and IV respectively. Upfront nephrectomy was done for 30 cases. Six patients had tumor relapse (2 lung and 4 local recurrence). Thirty months OS and EFS were 84.3% and 81.1% respectively. Twenty seven SV practiced among 25 patients, lack or inadequate lymph nodes sampling represented 74.07% (20/27), intraoperative tumor ruptures were 18.52% and unwarranted preoperative biopsy occurred in 7.41%. The SV were not correlated with mortality (P value= 0.381), however they had significant impact on relapse (P value=0.001).On further analysis, tumor rupture was a predictor for recurrence reaching statistical significance (P value=0.003), whereas other violations were not.

CONCLUSION
Favorable outcomes could be achieved by compliance with evidence-based guidelines even in a resource limited country like ours. Violations were correlated with relapse, however only tumor rupture was of statistical significance in multivariate analysis. Failure of lymph nodes documentation was the main problem encountered and it should be avoidable in future practice.

ON09: CENTRAL VENOUS CATHETERS INSERTION IN CHILDREN UNDERGOING BONE MARROW TRANSPLANTATION: IS THERE A PLATELET LEVEL FOR A SAFE PROCEDURE?

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AIM OF THE STUDY
To compare the morbidity of central venous catheters (CVCs) placements in children undergoing bone marrow transplantation (BMT) with platelet level above and below 50,000/microliter and to investigate if there is a platelet count for a safe insertion.

METHODS
Prospective study that included 18 children who had placements of CVCs during BMT at our hospital between January 2017 and January 2019. Procedures were divided into two groups accordingly to preoperative platelets count (above and below 50,000/microliter). Data were collected and compared between groups regarding postoperative complications including bleeding or catheter related blood stream infections (CRBSIs).

MAIN RESULTS
Thirty four CVCs insertions have been performed in 18 patients. There were eighteen procedures below 50,000/microliter (median 27,500; range: 5,000-42,000) inserted with perioperative platelets transfusions and their postoperative levels were (median 59,500/microliter; range: 18,000-88,000). Allogeneic BMT was adopted in almost all patients (17/18, 94.45%) and beta thalassemia major was the commonest indication (11/18, 60.1%). Hickman catheters were inserted in 52.9% of all procedures. There were 8 complications (7 CRBSIs and one bleeding) encountered in all placements, with only 2 of them occurred in insertions below 50,000/microliter (one postoperative bleeding that managed conservatively and one CRBSI). Postoperative complications between both groups did not differ significantly (p value=0.07).

CONCLUSIONS
Postponement of CVCs insertions in thrombocytopenic children due to the fear of potential complications seems unwarranted as it has no significant impact on morbidity. Insertions of such catheters can be safe under cover of perioperative platelets transfusions regardless of the preoperative platelet count.

ON10: FOURNIER GANGRENE IN PEDIATRIC ONCOLOGICAL PATIENTS AND ITS SURGICAL TREATMENT – REPORT FROM A SINGLE CENTER

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INTRODUCTION
Fournier gangrene (FG) is a type of necrotizing fasciitis affecting genital, perineal and perianal areas. An endarteritis results in ischemia and thrombosis of subcutaneous vessels, followed by necrosis of the skin and adjacent subcutaneous tissue. FG is characterized by a sudden onset, rapid progression of the disease and the absence of a characteristic pathogen.

OUR EXPERIENCE
Five consecutive patients (2 girls and 3 boys) with FG were treated surgically in our center. All of the patients were undergoing chemotherapeutical treatment, four of them due to the Acute lymphoblastic leukemia (ALL) and one, due to the neuroblastoma (NBL). Very aggressive surgical measures were undertaken with multiple debridements and urinary diversion (cystostomy in 1 pt), as well as fecal diversion (colostomy) in 3 cases. Complete cure and resolution of FG was achieved in all of the cases and all of our patients are alive.

DISCUSSION
Diagnosis of Fournier gangrene is based primarily on clinical findings, regardless of the bacteriological examination. It is important to make an early diagnosis and implement a correct treatment plan. The main aim of the treatment of FG is urgent and aggressive repeated surgical debridement of all necrotic tissue and high doses of broad-spectrum antibiotics. In some of the cases urinary catheter, cystostomy or/and colostomy are required during the whole treatment to avoid wound contamination and thus improve healing.

CONCLUSIONS
Aggressive surgical approach as well as the broad-spectrum antibiotics, are warranted in order to save pediatric oncological patients with immunosuppression and Fournier gangrene.

ON11: INVESTIGATING WILM'S TUMOURS WORLDWIDE: A REPORT OF THE OxPLORE COLLABORATION

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AIM OF THE STUDY
Childhood cancer is neglected within global health. OxPLORE (Oxford Paediatrics Linking Oncology Research with Electives) describe early outcomes following collaboration between low- and high-income paediatric surgery and oncology centres.
METHOD
Collaborating centres included three tertiary hospitals in Tanzania, Rwanda and UK. Data were submitted by medical students following retrospective note review (January 2016 - December 2017) using a standardised data-collection tool. Primary outcome was survival (point of discharge/death).
MAIN RESULTS
104 patients over two years (Table 1). Survival was higher in the high-income institution (X^2 36.19, p<0.0001).
Age at diagnosis was comparable at the two African sites but lower in the UK (one-way ANOVA, F=0.2997, p=0.74). Disease was more advanced in Tanzania (X^2 7.57, p=0.02). All patients had pre-operative chemotherapy, and a majority had nephrectomy. Post-operative morbidity was higher in lower resourced settings (X^2 33.72, p<0.0001).

Conclusions
- This study demonstrates novel research methodology involving medical students collaborating across the global south and global north.
- The worldwide comparison informs institutional development, including improved access to oncological services, development of affordable health care and education.

TABLE 1

		Tanzania	Rwanda	UK	
Patients		n=71	n=26	n=7	-
Female Gender (%)		29 (41%)	11 (42%)	6 (86%)	p=0.07*
Median (range) age (months)		40 (4-113)	37 (6-104)	24 (14-145)	p=0.74**
Stage	I - II	10	10	3	**p=0.02** *
	III - IV	55	15	4	
Surgery		57 (80%)	21 (81%)	6 (86%)	p=0.94*
Post-operative morbidity (Clavien dindo)	I - II	9	15	6	**p<0.0001***
	III - V	48	6	0	
Survival		62 (87%)	24 (92%)	7 (100%)	**p<0.0001***

*Chi-squared **One-way ANOVA

ON12: RISK FACTORS OF POST-SURGERY COMPLICATIONS IN CHILDREN WITH THYROID CANCER

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AIM OF THE STUDY
We report our surgical experience with thyroid malignancies, performed in collaboration by a high-volume endocrine surgeon and paediatric surgeon.

METHODS
After the IRB approval, retrospective analysis of patients treated for thyroid malignancies between 2006-2018 was performed. We aimed to evaluate the associations of post-surgery complications with potentially risk factors including: age, type of the cancer, type of the primary surgery, and presence of metastasis.

MAIN RESULTS
Pathological examination of all surgical specimens (82 cases) demonstrated that 22 (26.8%) children had thyroid malignancy (68% female; median age 16.9 years; median follow-up 6 years). Histologically, 6 (27.3%) patients had MEN, papillary carcinoma 13 (59%) and 3 (13.7%) patients had medullary carcinoma. Neck lymph node metastases were a common type of relapse diagnosed in 8 (36.4%), distant metastases in 6 (27.3%), and a combination of local and distant recurrences in 4 (18.2%) patients. 7 (31.8%) children had surgical complications; 1 child had unilateral vocal cord paralysis (UVCP), 6 (27.3%) had transient hypoparathyroidism and 1 child had both complications. No patient had permanent hypocalcaemia or bilateral NLR nerve damage. The higher risk of complications in univariate logistic regression appeared with children with metastasis (38.5% vs 0%, R2 = 0,341, OR 12.99, p=0.026) and with primary surgery including lymph nodes (54.5% vs 9.1%, R2 = 0,318, OR 12.0, p=0.040). However, in the forward logistic regression analysis only metastasis remained significant.

CONCLUSIONS
Postoperative complications were significantly associated with presence of metastasis, extrathyroidal tumor extension, central compartment dissection, and ipsilateral nodal removal.

PW17UR01: COMPRARISON OF TREATMENT METHODS FOR STONE IN LOWER CALYX IN CHILDREN WITH FLEXIBLE URETEORENOSCOPY AND MICROPERC - PROSPECTIVE STUDY

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INTRODUCTION
Development of the equipment and miniaturization of endoscopes allows for the treatment of children with stones in the lower calyx in each age group. The aim of the paper is to compare the effectiveness of flexible-URS and MicroPERC in the treatment of lower calyceal stones.

MATERIAL AND METHOD
The evaluation assessed 35 children (aged 3,5 – 18; mean 9,5) treated with flexible-URS and 15 children (aged 3 years -16; mean 8,2) treated with MicroPERC. The procedures by the flexible scopes were done since 2013 and by the MicroPERC since 2015. The treatment was applied to children with stones in the lower calyx. A complete removal of the plague and no complications were considered as a very good result; residual plague up to 2mm and no complications were considered a good result, and resistant stone in the lower calyx or/with concomitant complications were considered as a bad result.

RESULTS
In the group treated with the flexible-URS the results were: 91.4% very good and 8.6% bad. In the group treated with the MicroPERC the results were: 87.5% very good, 6.25% good and 6.25% bad.

DISCUSSION
There is still too little data predicting clearly the success of applying one method in children. Flexible-URS and MicroPERC are the treatment of choice for stones in the lower calyx, but still ESWL is the first line in children.

CONCLUSIONS
Flexible ureterorenoscopy method is more effective than MicroPERC method for a lower calyx stone of any size, and it carries a lower risk of complications.

PW17UR02: PATERNITY RATES OF ADULTS OPERATED FOR CRYPTORCHIDISM AS CHILDREN AND THE ROLE OF THE AGE OF SURGICAL TREATMENT IN PATERNITY

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OBJECTIVES
To determine if paternity is affected in patients with a history of cryptorchidism in comparison with a control group. To determine the role of the age of surgery in said affectation.

METHODS
A retrospective cohort study that compared a group with a history of cryptorchidism by means of a survey, with a control group.

RESULTS
A total of 157 cases participated, 37 cases were bilateral(23.57%) and 120 unilateral(76.3%) and 100 controls with ages between 31 and 51 years. The average age of surgical treatment was 6 years(6 months to 17 years). No difference was observed in the number of children and a history of cryptorchidism. No significant difference was observed between the age of surgery and paternity. Separating the unilateral and bilateral affectation, no statistically significant differences are observed between the proportion of paternity in bilateral and unilateral cryptorchidism and paternity, although the proportion of paternity rates were lower compared to the control group. The time to pregnancy is 10.6 months for the unilateral group, 15.8 months for the bilateral group and 8.1 months for the control group.

CONCLUSION
No difference in the paternity rate between patients operated on as cryptorchidism compared to a control group of healthy men in unilateral cases. There are no differences in the paternity rates of patients operated on for cryptorchidism in relation to the age of surgical intervention or the number of children. The low number of bilateral cases can be the cause of descriptive differences without statistical significance.

PW17UR03: DOES STITCHING OR CHOPPING SAVE YOU TIME?

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AIM
Foreskin Reconstruction (FR) has been demonstrated as a valid option for children with distal hypospadias with no increased incidence of complications. We aim to explore if there is a difference in operative time between FR and circumcision at the time of Tubularised Incised Plate (TIP) repair.

MATERIALS AND METHODS
We retrospectively reviewed operative records of all consecutive patients who underwent TIP repair in the last 5 years (between January 2014 and December 2018). Patients with additional procedures (chordee correction, graft, inguinal hernia, orchidopexy etc) and those previously circumcised were excluded. Operative times for both groups were recorded and compared. Statistical analysis was done using Mann Whitney U test.

RESULTS
A total of 153 TIP repairs were identified. 37 patients were excluded. Of the 116 patients included in the study 69 underwent FR and 47 had circumcision. The median operative time for TIP repair with foreskin reconstruction was 1 hour and 16 minutes (range: 46 minutes to 1 hour 53 minutes). The median operative time for TIP with circumcision was 1 hour and 18 minutes (range: 59 minutes to 1 hour 51 minutes). Z score was -4.99 and $p<0.01$.

CONCLUSION
We found no significant difference in operative times for TIP repair with foreskin reconstruction and TIP repair with circumcision. This is another factor to be considered in the debate between the two techniques.

KEY WORDS
TIP repair, Foreskin reconstruction, circumcision, operative time.

PW17UR04: LONG TERM RESULTS OF BLADDER AND RENAL FUNCTION IN PRENATALLY DIAGNOSED MEGACYSTIS

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AIM OF THE STUDY
Aim of this study was to determine the long-term outcome of bladder and renal function in patients diagnosed with fetal Megacystis (MC).

METHODS
25 children who survived out of 68 with prenatally diagnosed MC between 1991 and 2017, were studied retrospectively to evaluate bladder and renal function. Lower urinary tract symptoms (LUTS), pre- and postnatal intervention, urodynamic studies, therapy and overall outcome were reviewed.

RESULTS
The most common causes were; posterior urethral valves PUV (n= 14), Prune belly syndrome (PBS n= 2 males), other urological diagnosis (4 males, 1 female) and non-urologic diagnosis (2 males, 2 females). Six out 25 (24%) showed normal bladder function from the outset. In 13 (52%) bladder function normalised during the period of review after therapy. Six (24%) cases showed persisting bladder dysfunction throughout the study period.

18 patients grew up with normal renal function (CKD1) and 7 with (CKD 2-5). The 7/25 (28%) cases with an impaired renal function were mostly diagnosed with PUV and PBS, and six of them had a vesicoamniotic shunt (VAS) inserted prenatally.

CONCLUSIONS
In our study the long-term follow up showed normal or improved bladder function in 76% cases. The six cases with persisting bladder dysfunction had severe LUTO. 72% of patients who survive postnatally have satisfactory renal function at long-term follow-up. 28% of cases with impaired renal function were mostly diagnosed with PUV and PBS. In six of them VAS was performed prenatally but did not improve the renal function considerably

PW17UR05: CLINICAL AND DEMOGRAPHIC CHARACTERISTICS OF PATIENTS WITH URINARY TRACT HYDATID DISEASE

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AIM OF THIS STUDY
Cystic echinococcosis (CE) is endemic in many parts of the world such as Tunisia. It primarily affect the liver and the lung,kidney can be affected but rarely. In this study,we examined the clinical and demographic characteristics of patients with renal CE.

METHODS
The records of 57 consecutive patients with renal CE who were admitted to our departments from January 1982 to september 2017.

RESULTS
Our series includes patients aged from 4 to 87 years old and an average age of 43 years old with female predominance (64,91%). 67% were from rural region and 45% reported their contact with dogs. The most common symptom was lumber fossa pain (60%),hydaturia which is a pathognomonic sign was reported in 15%. The hydatid serology was performed in 47% with positive value in 86%. Ultrasound has been the first examination (96%),it has detected other intra-abdominal locations in 23 cases and the Gharbi classification concluded a predominance of Type I (24%). Computed tomograhy (CT) was performed in 40% for complicated forms. For treatment,Laparoscopic procedure was performed in a single pediatric case,the rest were treated by lombotomy using PAIR procedure (punction- aspiration-injection-reaspiration).The median duration of follow-up was 6 years with simple evolution in 90%,53% of post-operative complications were infectious, only One case of death.

CONCLUSION
Renal hydatid disease is a rare hydatidosis. In our endemic country,this disease affects women and adults more than men and children with good evolution.

PW17UR06: THE EFFECTIVENESS OF DEGLOVING AND SKIN ANCHORING TECHNIQUE FOR THE TREATMENT OF ISOLATED BURIED PENIS

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AIM OF THE STUDY
Buried penis has long been a problem even its uncommonness. Many techniques have been described with diverse outcomes. The aim of the current study is to prove the effectiveness of skin anchoring technique that effectively treats the isolated buried penis.

METHODS
Following approval of the ethical committee with 2019.023.IRB2.012, a retrospective chart review was performed on all patients who had buried penis repair from 2016 to 2018. Patients those have accompanying congenital anomalies and a BMI over 25 were excluded. The primary outcome was the recurrence while the secondary outcome was the long-term satisfaction of the patient and the parents. As a standard of care, all patients were followed up at postoperative 1st, 6th, 12th and 24th months. Patients those have not shown up were reached out by phone.

A complete degloving of penile shaft skin was performed followed by two fixation sutures (5/0 PDS) at 5 and 7 directions between the skin dermis and Buck's fascia at the penile base and trimming the redundant prepuce.

MAIN RESULTS
There have been 12 patients admitted either with the complaint of the buried penis or demand for circumcision. The mean age was 4,67±2,84 years and the mean follow up was 15,83±7,84 months. One (8,3%) patient had a recurrence who was lost to follow up but reached out by phone. Rest of the patients had esthetically satisfactory outcomes.

CONCLUSION
When treating patients with an isolated buried penis; degloving and skin anchoring technique is more than enough.

PW17UR07: PAOLOMO VS TAUBER PROCEDURES FOR PEDIATRIC VARICOCELE: COMPARATIVE ANALYSIS OF TWO CENTERS

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AIM OF THE STUDY
To compare clinical outcomes after varicocele treatment managed either by Palomo procedure (PP) or Tauber antegrade sclerotherapy (TAS), with an emphasis on recurrence and complication rates.

METHODS
From 2009 to 2017, 209 cases treated in two different Italian Centers were retrospectively evaluated. Patients were divided in two procedure-related groups: Group A included 114 patients undergone TAS and Group B 95 patients undergone PP. Outcome measures included varicocele recurrence/persistence and postoperative hydrocele. Group A patients were followed-up for at least 12 months, while only 38 patients in Group B had a 12 months' follow-up.

MAIN RESULTS
Recurrence/persistence rate was 5% and 2,7% in group A and group B, respectively; minor complications (oedema, haematoma) were identified in 4% of group A patients, whereas hydrocele developed in 19% of group B patients (p=0), 71% of them required surgical treatment. Comparison of reactive hydrocele and recurrence rates with the variable length of follow-up showed that both parameters were statistically dependent on the duration of postoperative surveillance ($p<0.05$).

CONCLUSIONS
Comparison of both groups did not reveal significant differences in varicocele recurrence/persistence. PP was associated with a high rate of secondary hydrocele. According to our data, TAS appears to be more successful than PP, with a low overall complication rate. The majority of varicocele recurrences and postoperative hydroceles were seen in patients who were followed-up for more than 12 months. Therefore appropriate length of postoperative surveillance is deemed necessary in these patients

PW17UR08: FACTORS PREDICTING TESTICULAR ATROPHY AFTER PEDIATRIC ORCHIDOPEXY

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AIM OF THE STUDY
to estimate the incidence of and associated risk factors for post-orchidopexy testicular atrophy.

METHODS
688 children with undescended testis were treated from January 2009 to January 2014.The following independent variables were captured: age at surgery, type of undescended testis, preoperative and postoperative testicular position and size, hormone treatment,surgical approach (single vs. 2-stage),post-operative complications, and results (focusing on risk factors for atrophic testes).

MAIN RESULTS
There were 816 attempted orchidopexies involving low type (n =562), ectopic type (n = 3), and high type testis (n = 251). There were a total of 60 (7,3%) post operative atrophic testis.The mean operative age of the patients whose evolution was enamelled by testicular atrophy was 4.6 years compared to 4.9 years in patients who did not have this complication.Testicular atrophy was significantly more common in laparoscopic procedures (14,4%) than in inguinal orchiopexy (8.1%) (p =0,041) and more often in the case of a testicle in the deep inguinal orifice (19.7% vs. 5.6%, p <10-3) and intra-abdominal testis (28, 6% vs 8.1%, p = 0.002).

CONCLUSIONS
The most significant risk factors associated with testes MADE atrophic were high testis,testicular hypotrophy preoperatively,epididymal abnormalities and vessels problems.
Testicular atrophy is the main complication of cryptorchidism surgery. complication as well as the risk factors for its occurrence must be clearly clarified to the parents preoperatively

PW17UR10: SAVE THE FORESKIN: OUTCOMES OF PREPUTIOPLASTY IN THE TREATMENT OF CHILDHOOD PHIMOSIS

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BACKGROUND
Symptomatic phimosis is a common childhood urology complaint. Circumcision was traditionally the treatment of choice, but its popularity in cases of non-scarred phimosis has been superseded by more conservative methods like preputioplasty. We sought to examine outcomes of preputioplasty for the treatment of non-scarred pathological phimosis in two UK paediatric surgery tertiary centres.

METHODS
Retrospective case series selecting cases performed in both departments over a 4 year period (January 2012- December 2015). Inclusion criteria: non-scarred pathological phimosis treated with preputioplasty. Exclusion criteria: diffuse scarring of foreskin or presence of balanitis xerotica obliterans (BXO), preputioplasty performed as part of hypospadias repair. Outcome measure was treatment success as evidenced by fully retractile prepuce at follow up. Follow up occurred between 3 and 24 months.

RESULTS
We identified 126 patients, 6 were excluded due to the above criteria.Median age was 13.4 years (range 10 months – 18 years).Median follow up was 13 months (range 3 – 24 months). 115 patients (96%) had successful treatment as evidenced by satisfactory post-operative cosmesis and complete resolution of phimosis at follow up. Recurrence of phimosis occurred in 5 patients (4%). Mean time of recurrence was 6 months, with a median age of recurrence of 15.3 years (range 10.7-16.7 years). All patients with recurrence were successfully treated with circumcision.

CONCLUSION
Foreskin conserving methods like preputioplasty are a valid option in the treatment of non-scarred pathological phimosis.

PW17UR11: BLADDER MANAGEMENT OF CHILDREN WITH SPINA BIFIDA

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AIM OF THE STUDY

The management of neuropathic bladder in spina bifida patients aims to keep the bladder safe and the patient continent. Implementing a strict bladder management protocol helps to achieve that. The aim of the study is to evaluate the long-term outcomes of patients treated in our institution.

METHODS

Patients with spina bifida treated undergo a strict bladder protocol. This includes early introduction of clean intermittent catheterization [CIC], anticholinergics and regular bladder function assessment. Primary outcomes are achieving a safe bladder based on urodynamic results and urinary continence. P value calculated with Paired t-test. Results are mean. Ethics approved.

MAIN RESULTS

50 (22 male) patients were included. Mean age (5-18). Length of follow up 11.2 years. Two patients lost follow up.

83.3% (40/48) are on CIC and 87.5% (42/48) are on anti-cholinergics. Nine patients required recurrent BOTOX injections indicated by the urodynamic results and symptoms.

39/48 patients are currently considered to have a safe bladder, of which 77% are older than 10 years and dry with CIC. 9/39 (23%) required BOTOX injection. Three patients have spina bifida occulta.

Comparing first and last invasive urodynamic of the safe bladder patients, total bladder volume has increased by 100.86 ml (P=0.0001), and significant decline was noticed with the max-pressures (p = 0.0085)

One patient had bladder augmentation.

Six patients awaiting upstaging of the management

CONCLUSION
Less invasive management of the spina bifida bladder can be achieved with a strict protocol. Close monitoring is of paramount importance to avoid complications.

PW17UR12: CHALLENGES IN THE DIAGNOSTIC-THERAPEUTIC PATHWAY OF PATIENTS WITH ANTERIOR URETHRAL VALVES AND DIVERTICULA

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AIM
Anterior urethral valves (AUV) are a rare obstructive condition of male urethra. Patients with AUV have a widely variable clinical pattern related to the degree of obstructive micturiction. In literature there's a controversial argument about the relation between AUV and anterior urethral diverticulum (AUD). It isn't clear whether AUV/AUD are embriologically distinct entities or part of continuum and what's the treatment of choice, endoscopic resection versus open diverticulectomy.

METHODS
We present our series of AUV+/-AUD managed in a period of 13 years, focusing on demographics, presenting symptoms, upper urinary tract deterioration, management, outcome.

MAIN RESULTS
Six patients were observed in the period of study, 5 affected by AUV+AUD and 1 by AUV only. Median age at presentation was 2 years (range 0 – 14). Presenting clinical scenario was: UTI and hydroureteronephrosis (6), hematuria and pathological urinary stream (1), loss of function of 1 renal unit (1). Diagnostic workup consisted of ultrasound, cystogram and renogram in all patients, videurodynamic study in 2, uroflowmetry in 2. All patients underwent a cystourethroscopy and AUV resection with cold knife. The 5 AUV+AUD patients presented a recurrence of symptoms at follow-up; 3 of them needed an open diverticulectomy 6 months after the AUV resection, with resolution of symptoms; the remaining 2 are scheduled for diverticulectomy.

CONCLUSION
In this series severe urethral obstruction was related to AUV-ADV association. The persistent turbulent flow after valve resection cause an obstructive pattern. In these cases the optimal treatment is a primary open diverticulectomy

PW18LG01: TECHNICAL STANDARDIZATION OF MANAGEMENT OF CHILDREN WITH PILONIDAL SINUS DISEASE USING PEDIATRIC ENDOSCOPIC PILONIDAL SINUS TREATMENT (PEPSiT) AND LASER EPILATION

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AIM OF THE STUDY
This study aimed to standardize pediatric endoscopic pilonidal sinus treatment (PEPSiT) associated with laser epilation for management of pediatric patients with pilonidal sinus disease (PSD).

METHODS
Fifty-nine patients, 23 girls and 36 boys with an average age of 16 years, underwent PEPSiT in our institution over a 30-months period. Ten/59 patients (16.9%) had a recurrent PSD after open repair. Furthermore, 4/59 patients (6.7%) presented a concomitant pilonidal cyst. Pre- and post-operative management, surgical outcome, recurrence of disease, post-operative pain, hospital stay, analgesic requirements and patients' satisfaction levels were evaluated.

MAIN RESULTS
All children underwent laser epilation before and after surgery in the last 15 months. The average operative was 27.5 minutes (range 20-45). No intra-operative neither post-operative complications were recorded. The average pain score during the first 48 post-operative hours was 2.7 (range 2-5). The analgesic requirement was limited to the first 24 hours postoperatively. The average hospital stay was 22.4 hours (range 18-36). They changed dressing daily, by applying topically 2% eosin and silver sulfadiazine spray. At 1 month postoperatively, the external openings were closed in all patients. With a maximum follow-up of 30 months, only 1 recurrence (1.6%) was recorded and successfully re-treated with PEPSiT.
Conclusions: On the basis of our preliminary experience, PEPSiT represents the technique of choice for treatment of PSD in pediatric population. However, it is mandatory to standardize the steps of technique consisting in pre- and post-operative laser epilation, PEPSiT procedure and accurate wound management for at least 2-3 weeks postoperatively.

PW18LG02: IS PARENTS' PERCEPTION OF QUALITY OF LIFE WORSE THAN CHILDREN OPERATED FOR ANORECTAL MALFORMATION?

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AIM OF STUDY
To compare the difference in terms of vision of quality of life (QoL) between the parents and the children treated by posterior sagittal anorectoplasty (PSARP) for an anorectal malformation (ARM)

METHODS
Parents of children operated for an ARM by a PSARP approach and aged more than six years were asked to complete the disease specific quality of life questionnaires, translated in Arabic. They were divided into two groups according to their children's age (8-11years and 12-16 years) . The responses were compared to the patients themselves.

MAIN RESULTS
Twelve families were enrolled in this study. The HAQL was significantly different between parents and patients ($p = 0.09$), with parents scoring worse. This difference was found for all the types of ARM. The most affected domains for the parents concerned physical symptoms and continence compared to the patients that had affected body image and social functioning domains. The scores improved with age but this was not statistically significant.

CONCLUSION
Parents of children treated for ARM have a higher level of anxiety and a lower perception of QoL than the patients. This difference improves with age This may be explained by coping strategies and must indicate a strategy of care for all the family since birth.

PW18LG03: APPROPRIATE TREATMENT FOR COMPLICATED APPENDICITIS IN CHILDREN

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Aim of the Study
Although emergent appendectomy (EA) for complicated appendicitis (CA) is straightforward, interval appendectomy (IA) is sometimes chosen to treat CA with an abscess or phlegmon because of the exacerbated inflammation. We reviewed our institutional experience of CA cases with a focus on the outcome of treatments.

METHODS
A total of 144 children with CA treated between 2009 and 2018 were retrospectively analyzed. The numbers are shown as the % or median. P<0.05 was regarded as significant.

MAIN RESULTS
EA was performed for 104 children (Group EA). The remaining 40 initially underwent non-operative management (NOM): 25 underwent IA successfully (Group IA-S), 9 failed NOM (Group IA-F), and 6 never underwent surgery. All operations were attempted laparoscopically. On comparing the outcomes of EA to NOM, NOM tended to be chosen for cases that took longer to diagnose (2 vs. 4 days; p<0.001), those with an elevated CRP level (7.17 vs. 9.97 mg/dL; p=0.008), or when appendicitis formed an abscess (20% vs. 90%; p<0.001). However, in the NOM group, cases with a thicker appendix (14.3 vs. 10.5 mm; p=0.02) or containing fecalith (89% vs. 39%; p=0.02) were more likely fail NOM. Group IA-F had a significantly longer duration of surgery (162 vs. 71 minutes; p=0.001), higher rate of conversion to laparotomy (22% vs. 0%, p=0.046), and higher incidence of postoperative complications (22% vs. 0%, p=0.046) than Group IA-S.

CONCLUSIONS
In the treatment for CA, select patients may need a modified treatment strategy to reduce the incidence of NOM failure.

PW18LG04: JEJUNO-INTESTINAL ATRESIA: EVALUATION OF THE EFFICACY OF LAPAROSCOPIC APPROACH

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AIM
As jejuno-ileal atresias present in various forms and can be associated with distal atresia(s), aim of this study was to perform systematic review of laparoscopic approach with regards its management efficacy.

METHODS
Pubmed® was searched using terms 'jejunal', 'jejuno-intestinal atresia', 'laparoscopic' or 'laparoscope-assisted'. Data collected included age, weight, comorbidities, treatment and outcomes.

RESULTS
Six articles published 2004-2015 met inclusion criteria with 65 neonates, 1-3 days (mean 1.58) old and weighing 2670 gram (1770-3110 gram; n=17 unknown) at time of surgery. There were n=11 comorbidities: cardiac anomalies (n=7), Meckel's diverticulum (n=2), hypoplasia of corpus cavernosum (n=1), right renal agenesis (n=1). Meconium peritonitis was found in n=5. All 65 patients underwent laparoscopic-assisted procedures with primary anastomosis after exteriorizing the atretic bowel through umbilical port site. N=41 (63.1%) neonates were operated through single-port approach. Conversion was reported in n=2 (3.1%); concomitant colonic atresia (n=1) and markedly dilated proximal bowel (n=1). N=6 (9.2%) had multiple atresia (9.2%), of which n=1 was identified at reoperation. There were n=8 (12.3%) complications; anastomotic leak from missed distal multiple atresia n=1, wound cellulitis n=1, adhesions n=4 and anastomotic stricture n=2. N=7 (10.8%) required redo surgery. Mean parenteral nutrition time was 8.8 (7-11) days. There were no lethal outcomes.

CONCLUSION
Laparoscopic assisted technique with bowel exteriorization and anastomosis is opted for jejuno-ileal atresia when minimal access approach is preferred. There is a complication rate of>10%. Concomitant distal atresias remain the main concern for laparoscopic-assisted approach; as both neonates with distal atresia required conversion or redo surgery.

PW18LG05: PRESENTATION, MANAGEMENT AND OUTCOME OF HAEMORRHOIDS IN CHILDREN – A SINGLE CENTRE EXPERIENCE

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AIM OF THE STUDY
Unlike in other acquired ano-rectal disorders, there is a paucity of published evidence regarding presentation and management of haemorrhoids in children. We aimed to review patients presenting to our centre (2005-16) to evaluate symptoms, management and outcome.

METHODS
We performed a retrospective case note review (ethics approved), patients identified from electronic records. Search terms were 'haemorrhoid', 'hemorrhoid' and 'pile'. Demographics, presenting symptoms, treatment and outcomes were collected. Data are median (range).

MAIN RESULTS
52 patients (44 male) presented age 5.1 years (0.6-15.9 years). Symptoms were perianal swelling in 46/52 (89%), painful defecation in 15/52 (29%), bleeding on defection in 13/52 (25%) and chronic anal pain in 10/52 (19%). 11/52 (21%) patients had constipation. A photograph was presented by 20/52 parents (39%).
34/52 (65%) patients required conservative treatment only and 18/52 (35%) underwent operative intervention. Of these 18 patients, 13/52 (25%) had injection sclerotherapy under general anaesthetic. 4/18 (22%) required 2 injections and one required three. 1/18 (6%) had injection of sclerotherapy and subsequently anal dilatation. 2/18 patients underwent primary anal dilatation, 2 had haemorrhoid excision and 1 patient examination under anaesthetic. 17/18 (94%) were discharged from surgical care after median 19.7 months (2-119 months).

CONCLUSIONS
Symptoms of haemorrhoids in children are perianal swelling, pain and bleeding on defecation. Most patients do not have significant constipation. 2/3rd of children can be successfully managed conservatively. The majority (>90%) who require intervention responded to 1 or 2 treatments of injection sclerotherapy. Haemorrhoid excision is rarely required.

PW18LG06: COMPLICATIONS OF MECKEL'S DIVERTICULUM IN CHILDREN: A 10 YEARS EXPERIENCE

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AIM
To evaluate patients with complications of Meckel's Diverticulum (MD).

METHOD
The patients who were operated on for MD complications between 2008-2018 were evaluated retrospectively for age, gender, emergency or elective surgery, histopathological evaluation and surgical method.

RESULTS
62 patients (38 males, 24 females) (6 months-17,08 years), 35 underwent emergent and 27 elective surgery.
35 patients (median 7 years) who underwent emergency surgery, only 3 had preoperative diagnosis. 14 patients had invagination, 11 had internal herniation, 6 had diverticulitis and 4 had perforation. 13 patients underwent laparoscopy-assisted surgery and 22 undergone laparotomy. In 16 patients, ileal segment resection (intussusception n=12, perforation n=2, internal herniation n=2), in 19 patients wedge resection (intussusception n=2, internal herniation n=9, diverticulitis n=6, perforation n=2) was performed. Histopathological evaluation revealed ectopic gastric tissue in 16 patients and both ectopic stomach and pancreas tissue in 6 patients. Ectopic tissue was not observed in 13 patients.
27 patients (6 months-14,25 years, median 4,73 years) who underwent elective surgery had rectal bleeding. Tc-99m pertechnetate imaging was performed to all patients. Ectopic focal substance accumulation was detected in 22 patients.. Five patients with negative scintigraphic finding were diagnosed by laparoscopy. 6 patients underwent laparotomy and 21 undergone laparoscopy-assisted surgery. In 11 patients, ileal segment resection was performed whereas wedge resection was performed in 16 patients. Histopathological examination revealed ectopic gastric mucosa in all cases.

CONCLUSION
MD had various complications in children. Whether or not it contains ectopic mucosa does not affect the development of complications requiring urgent surgery.

PW18LG07: COMPARISON OF INFLAMMATORY STRESS RESPONSE BETWEEN LAPAROSCOPIC AND OPEN APPROACH FOR PEDIATRIC INGUINAL HERNIA REPAIR IN CHILDREN

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AIM OF THE STUDY
To compare inflammatory stress response between laparoscopic percutaneous inguinal ring suturing (PIRS) and open modified Marcy technique for pediatric inguinal hernia repair.

METHODS
From May 2017 to April 2018, 32 male children with median age of 4.5 years undergoing inguinal hernia repair were included in randomized controlled trial. Divided in two groups, using random number generator, depending on surgical approach. The blood was tested in 3 time frames for white blood cells count(WBC), C-reactive protein(CRP), Interleukin-6(IL-6) and tumor necrosis factor alpha(TNF-α).

MAIN RESULTS
Significant increase in concentration for all inflammatory biomarkers, that occur over time, has been found($p<0.001$ for all). Additionally, it was also found that the type of surgery significantly influenced the level of WBC, CRP and IL-6 with Marcy showing a higher level of inflammatory response(WBC $11.4\pm3.1x10^9$/L; CRP 11.5 mg/L;IL-6 11.0pg/ml) than the PIRS(WBC $7.6\pm1.6x10^9$/L; CRP 0.8 mg/L; IL-6 2.0 pg/ml)($p<0.001$ for all). Similar pattern was also found for TNF-α (Marcy 16.8pg/ml; PIRS 10.1pg/ml), but correlation between surgery type and concentration of this biomarker was significant only at the 0. 1 level($p=0.055$). The mean operation time was significantly shorter(9±2 min) in PIRS group compared to Marcy group(25±7min)($p<0.001$). Significantly lower median of visual analog scale score(VAS) was found in PIRS group (VAS=2) compared to Marcy group (VAS=6)($p<0.001$).

CONCLUSIONS
Use of PIRS technique in children shows significantly lower surgical stress in comparison to open hernia repair.

PW18LG08: EFFICACY OF CONSERVATIVE TREATMENT FOR THE MANAGEMENT OF APPENDICULAR MASSES (AM) AND STUDY OF RISK FACTORS FOR THERAPEUTIC FAILURE

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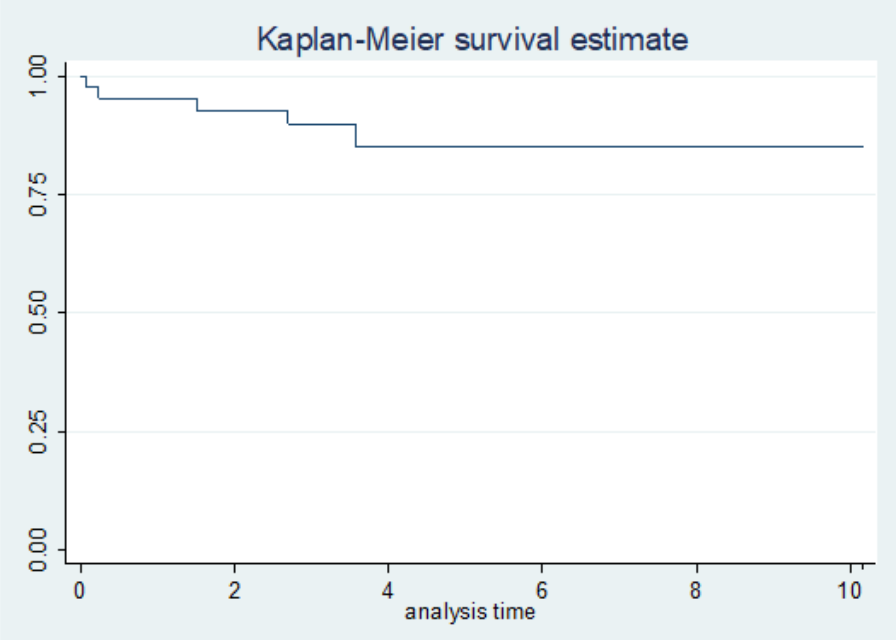
AIM OF THE STUDY
Review of the efficacy of the conservative treatment of AM, using initial antibiotherapy and delayed appendectomy between 3 and 6 months later. Identification of risk factors for failure and early surgery.

METHODS
Retrospective cohort study of AM in pediatric patients of our center in the period 2012-2018. Demographic, clinical, analytical and radiological variables were collected. Study of survival and risk factors for the failure of conservative treatment using Cox regression and logistic.

MAIN RESULTS
Conservative treatment was carried out in 45 patients between 3 and 16 years of age, of whom 5 suffered from a second episode and needed an appendectomy before the scheduled date for deferred surgery (11.1% with 95% CI: 4.5 to 25.7%). Conservative treatment in considered effective in 88.9% of the patients (95% CI: 75.3 to 98.5%). There were no surgical complications in any patient to whom a deferred surgery could be performed. We did not find any demographic factor (sex, age, weight), clinical (fever, antibiotic), analytical (CRP and % neutrophils) or radiological (appendicolitous or intra-abdominal abscess) in the regression analyzes that allowed us to predict the risk of failure of conservative treatment.

CONCLUSIONS
Great majority of patients can benefit from a conservative treatment, allowing a delayed appendectomy without complications. However, we have not found risk factors that allow us to predict therapeutic failure. Consequently, all patients should follow clinical monitoring until elective appendectomy.



PW18LG09: MECHANICAL BOWEL PREPARATION VERSUS NO PREPARATION IN DUHAMEL PROCEDURE IN CHILDREN WITH HIRSCHSPRUNG DISEASE

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AIM OF STUDY
Mechanical bowel prep (MBP) prior to surgical treatment of Hirschsprung`s disease (HSCR) has been a great problem of pediatric surgeons for a long time. we conducted a single institution randomized controlled trial to evaluate the efficacy of no MBP in children with HSCR undergoing Duhamel procedure.

METHODS
In this study, children with HSCR who candidate for Duhamel procedure were included (40 cases vs 40 controls) .In case group, Intra operatively after transection of bowel al the level of transitional zone, faces bulk was pulled up from upper part of rectum to sigmoid colon above the peritoneal reflection and aganglionic bowel was resected .Inspissated stool in the distal of rectum was removed by rectal washout intraoperatively . In the control group, routine MBP was performed. Cleanness of rectum was evaluated intraoperatively.

RESULTS
In this study, a total of 80 children were enrolled. .In 32 patients (80%) the goal of MPB was achieved in 4 hours. PEG volume mean was 1372.3± 231.9 ml. Preoperative rectal wash out fluid was 635± 233.3ml. There was no statistically significant difference in individual complication rates between groups .Four patients (5%) had intraabdominal infection and 16 (20%) had wound infection. We have no anastomotic leak in our groups. All children or parents in control group described the pre-operative MBP as the most unpleasant part of the hospital administration.

CONCLUSION
For young children with HSCR who scheduled for Duhamel operation, we had found no clear benefit to MBP.

PW18LG10: EFFECTIVENESS OF BOTULINUM TOXIN INJECTIONS FOR TREATING OBSTRUCTIVE SYMPTOMS IN PATIENTS WITH HIRSCHSPRUNG DISEASE: A SYSTEMATIC REVIEW

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BACKGROUND
About 30% of children with Hirschsprung disease experience persistent obstructive defecation problems after pull-through procedure. One of the current treatment strategies for this is Botulinum toxin injections in the internal anal sphincter. This systematic review aims to provide an overview of current evidence on effects of Botulinum toxin injections on obstructive problems in patients with Hirschsprung disease.

METHODS
In this systematic review evidence was aggregated after searching Pubmed, Embase and the Cochrane Library, using entry terms related to (1) Hirschsprung disease, (2) botulinum toxin injection, (3) obstructive defecation problems or enterocolitis. Data on procedural aspects, clinical outcome and patient characteristics were extracted.

RESULTS
This systematic review included 14 studies representing 235 patients with Hirschsprung disease. After botulinum toxin injections 76% of patients showed clinical improvement in short term and 45% in long term follow-up. Mean duration of clinical improvement was 5.25 months and patients needed a mean of 2.6 injections. Short-term response was correlated to long-term response, clinical improvement was higher in patients with rectosigmoid disease than longer segment disease, whereas a higher dose or specific type of botulinum toxin were not correlated to higher clinical improvement.

DISCUSSION
Current evidence suggests a good response to botulinum toxin in most patients, although mainly in short-term and with temporary effect. The evidence is limited by uncontrolled study designs, large heterogeneity in definitions of outcomes, indications for Botulinum toxin injections, length of follow-up and procedural aspects. We recommend botulinum toxin injections when a sphincter problem is suspected as cause of obstructive symptoms.

PW18LG11: SURGICAL MANAGEMENT OF PERIANAL ABSCESS IN NEONATES AND INFANTS

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BACKGROUND
We aimed: 1) to compare the recurrence rate following incision and drainage (I&D) with or without laying open of the fistula (I&DF); 2) to determine the value of microscopy and culture studies (MCS).

METHODS
Following ethical approval (RES-16-0000-326Q), a 10-year (2007-2017) review of <1-year-old patients was conducted. Presence of fistula was ascertained in all patients. Patients were divided in group A (I&D alone) and B (I&DF). Data are presented as number of cases (%), median (range) and analysed using Chi-square and Mann-Whitney U tests. P value <0.05 were considered significant.

RESULTS
We identified 108 patients [107 (99.1%) males] with 111 abscesses (3 bilateral); 26 in group A, 85 in group B. 64 (58%) on the right, 47 (42%) on the left of the midline. 22 (20%) recurred after 30 (6-372) days. MCS were performed in 65 (59%). Recurrence was higher in group A (9/26) vs group B (13/85), p=0.03 [RR 2.2, 95% CI 1.0-4.5]. There was no difference in recurrence within each group between patients with or without MCS: group A, p=0.1; group B, p=0.3.

Table

	Group A (26)	Group B (85)	P value
Age (days)	41.5 (18-332)	66.5 (21-328)	0.4
Side (right/left)	16/10	48/37	0.6
Symptoms duration (days)	4 (1-17)	3.5 (1-61)	0.8
Recurrence (%)	9 (34)	13 (15)	0.03
Recurrence side (right/left)	7/2	9/4	1
Time to recurrence (days)	24 (6-304)	46.5 (16-372)	0.3

CONCLUSIONS
Perianal abscess recurrence rate is lower when a fistula is laid open. There is no value in MCS.

PW18LG12: PERSISTENT CLOACAL MALFORMATION: PRENATAL DIAGNOSIS PREDICT ENDEAVOUR!

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AIM
Prenatal suspicious of cloacal malformation (CM) is difficult and diagnosis possible only in a minority of cases. Abdominal /pelvic cystic mass, urinary tract abnormalities and dilated bowel loops are considered non-specific/indirect signs of potential CM. Aim of present study was to assess the role prenatal suspicious of CM to predict common channel (CC) >3 cm long.

METHOD
Retrospective collected data of all patient treated at our institution for CM between 1999 and 2016 were performed. Patients were categorized based on CC > or < 3cm long. Prenatal ultrasound scans were reviewed to identify the presence of prenatal anomalies (abdominal cyst, hydronefrosis, dilated bowel, ascites, intraabdominal calcification, polyhydramnios). Fisher exact test was used as appropriate.

RESULTS
25 patients were referred for CM during the study period. Four patients were excluded from the study due to no prenatal diagnosis. Twenty-one patients were analyzed. Table summarized main results.

CONCLUSION
Our data suggest that prenatal anomalies detected at fetal ultrasound correlate with longer CC, although no odd risk factor, evaluated alone, reached significance.
Once confirmed by larger studies, such data could be conveyed to the parents for early counseling prior to workup and surgical reconstruction.

	CC > 3 cm 13 (62) pts	CC < 3 cm 8 (38) pts	p
Prenatal ultrasound anomalies; n (%)	10 (77)	2 (25)	0.03
Prenatal abdominal/pelvic cystic mass; n (%)	9 (69)	2 (25)	0.08
Hydronephrosis; n (%)	8 (62)	2 (25)	0.18
Distended bowel; n (%)	4 (31)	0 (0)	0.13
Polydramnios; n (%)	3 (23)	2 (25)	1
Ascites; n (%)	2 (15)	0 (0)	0.5
Peritoneal calcification; n (%)	2 (15)	0 (0)	0.5

PW19ON01: DIAGNOSTIC ACCURACY OF SERUM ALPHA-FETOPROTEIN LEVELS IN DETECTING A RECURRENT SACROCOCCYGEAL TERATOMA: A SYSTEMATIC REVIEW

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AIM OF THE STUDY
The incidence of children developing recurrent sacrococcygeal teratoma (SCT) is 2-35%. Serum alpha-fetoprotein (AFP) has been used as a tumor marker for malignant recurrences of SCT and could potentially be used during routine follow-up after SCT resection. However, the diagnostic accuracy of serum AFP-levels during follow-up has not been well established. Therefore, we aimed to systematically review the diagnostic accuracy of serum AFP-levels in recurrent SCT.

METHODS
We queried Search Premier, COCHRANE Library, EMCARE, EMBASE, PubMed, ScienceDirect and Web of Science databases to identify studies regarding patients diagnosed with sacrococcygeal teratoma with follow-up after resection with serum AFP-levels. We estimated sensitivity and specificity of serum AFP-levels.

MAIN RESULTS
Fifteen studies (613 patients, 121 recurrences) were included which mainly described serum AFP-levels in patients with recurrent SCT and led to a sensitivity for recurrent SCT of AFP-levels of 80%. A subgroup was created of articles that described serum AFP-values in all patients (n=6, 136 patients, 14 recurrences). Sensitivity and specificity in this subgroup were 52% and 95%, respectively. The sensitivity of APF-levels to detect malignant recurrence was 94%.

CONCLUSIONS
Diagnostic accuracy of serum AFP-levels to detect recurrent SCT seems promising, though sensitivity could be overestimated since serum AFP-levels are mainly described in patients with elevated AFP-levels or at recurrent SCT. Furthermore, serum AFP-levels could be helpful to detect malignant recurrences.

PW19ON03: A NEW SURGICAL APPROACH FOR CERVICO-MEDIASTINAL NEUROBLASTOMA (NB): CERVICO PARASTERNAL THORACOTOMY

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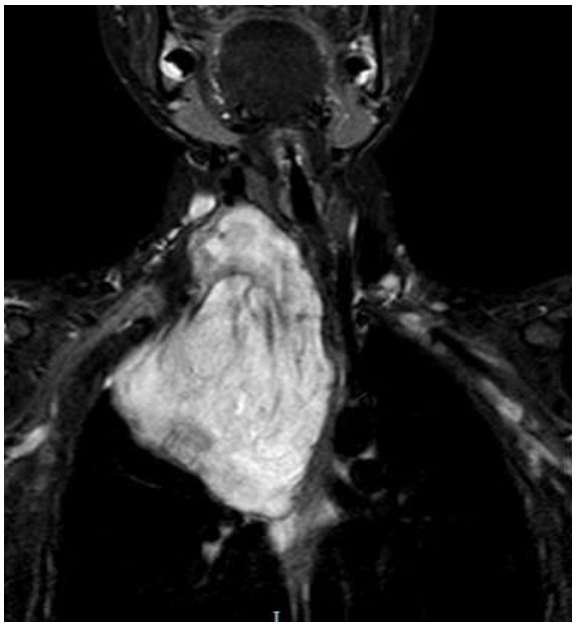
AIM OF THE STUDY
Cervico-thoracic NBs are roughly 15-20% of all cases. A simple cervicotomy or thoracotomy is not effective for a complete exposition and radical resection of these NBs. Therefore, the authors decided to adopt a new cervico-parasternal thoracotomy (CPT) to access cervical region and the ipsilateral costo-vertebral space.

METHODS
In 2017- 2018, the authors treated 4 right cervico-mediastinic NBs (age range 2.4 – 11 years), using the new CPT approach. The incision follows the anterior margin of the sternocleidomastoid muscle, then proceeds vertically down the right parasternal line as far as necessary. The following steps are:
1) detachment of major pectoralis muscle from its sternal insertion; 2) disarticulation of the ribs and clavicle at the level of sternal insertions; 3) vertical access by parasternal thoracotomy; 4) possible additional transverse thoracic incision (1 out of our 4 cases); 5) reconstruction of clavicle and rib-sternal junctions is performed with non-absorbable 2/0 sutures, major pectoralis muscle is sutured to the sternal margin.

MAIN RESULTS
Complete resection was achieved in all patients without major complications or perioperative mortality. Intraoperative red blood cells pack transfusion was necessary in 2 out of 4 cases. Median duration surgery ranged 4-8 hours. Median duration of hospitalization ranged 10 -14 days. After median follow-up period of 6 months all patients are free from diseases.

CONCLUSIONS
Comparing to conventional techniques using sternotomy, CPT provides a better exposition, switching from frontal to a lateral costo-vertebral view, and permits a radical resection, working safely with the heart apart.



PW19ON04: HIPEC (HYPERTHERMIC INTRAPERITONEAL CHEMOTHERAPY) IN PEDIATRIC ONCOLOGY – TECHNIQUE AND METHOD PRELIMINARY REPORT FROM A SINGLE CENTER

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INTRODUCTION
Peritoneal metastases in children usually indicate the advanced stage of cancer. They can occur in some cases of sarcomas (e.g. Desmoplastic small-round-cell tumor - DSRCT), rhabdomyosarcomas (RMS), Gastrointestinal Stromal Tumors (GIST) or primary disseminated ovarian tumors. Due to the limited absorption of chemotherapeutic agents through the peritoneal-plasma barrier (PPB), HIPEC procedure limits the systemic exposure to chemotherapy and permits the administration of its higher doses. The main purpose of HIPEC is to remove the visible macroscopic disease with complete cytoreduction (CRS).

INDICATIONS IN CHILDREN
A complete removal of the visible macroscopic disease with complete cytoreduction, absence of distant metastasis, normal kidney function, no radio or chemotherapy within the last 4 weeks, normal liver function and life expectancy for more than 6 weeks.

OUR EXPERIENCE
Three patients were treated with cytoreduction and HIPEC at the Department of Surgery and Urology for Children and Adolescents of the Medical University of Gdansk (Poland). Those were the first Pediatric HIPEC procedures performed in Poland. In all of the cases a complete resection (R0) was achieved. However, one patient died shortly after the procedure due to severe toxicity associated with heavy chemotherapy pretreatment and kidney damage before HIPEC in the setting of the second relapse of DSRCT.

CONCLUSIONS
CRS and HIPEC is technically possible in children and adolescents. For its safe course patients selection is of utmost importance. The best outcome was experienced in the treatment of DSRCT and a complete cytoreductive surgery seems to be the key factor in survival.

PW19ON05: SAFETY OF THE USE OF CENTRAL VENOUS ACCESS DEVICES IN PATIENTS WITH SICKLE CELL ANEMIA AND THALASSEMIA MAJOR

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AIM OF THE STUDY
Pediatric patients with sickle cell anemia (SCA) and thalassemia major (TM) are eligible for implantation of central venous access devices (CVAD). There is a lack of data in the literature about catheter-associated complications (CAC) in this patients. The objective of this study is to analyze the risk of CAC in this group compared with oncological patients.

METHODS
A retrospective case-control study was designed, including all patients with CVAD who underwent stem cell transplantation due to SCA/TM (cases group) or another oncological disease (control group) between March/2014 and September/2018. Number and type of complications, and the need of early removal was analyzed in both groups.

MAIN RESULTS
29 patients and 61 CVAD were included in the SCA/TM group (29 totally implantable venous access port (TIVAP), 28 Hickman devices, 3 Broviac devices and 1 double lumen TIVAP). 31 patients and 86 CVAD were included in the oncological group (OG) (43 TIVAP, 34 Hickman devices, 8 Broviac devices and 1 single lumen TIVAP). There was no difference in number of thrombotic complications (6.8% in SCA/TM group vs 3.6% in OG, p=0.38), central line-associated bloodstream infection (CLABI) (24.6% in SCA/TM group vs 25.6% in OG, p=0.89), mechanical disfunction (18.0% in SCA/TM group vs 19.8% in OG, p=0.79) or early removal (34.4% in SCA/TM vs 29.0% in OG (p=0.49) due to any CAC).

CONCLUSION
Our study supports the safety of using CVAD in patients with SCA/TM, without increasing the incidence of thrombosis or another CAC.

PW19ON06: LARGE ABDOMINAL TUMORS IN NEWBORNS. PITFALLS IN MANAGEMENT, SURGICAL DECISION MAKING AND SYSTEMATIC REVIEW

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AIM
Large and quickly progressive abdominal tumors endanger vital prognosis in neonates. There is no surgical consensus to manage these situations, especially when the ventilatory parameters and the haemodynamic status are rapidly worsening. In order to draw potential management guidelines, we reviewed our experience and conducted a systematic review of the literature.

METHODS
We collected all abdominal neonatal tumors operated from January 2013 to December 2018. Sex, prenatal findings, type of tumor, type of surgery ,age at the intervention were studied. For each patient we calculated the Score for Neonatal Acute Physiology (SNAP II) and the Paediatric Logistic Organ Dysfunction (PELOD) score. PubMed, Embase, Medline, and Cochrane Library were searched for abdominal solid tumors, operated in no more that one-month-old patients.

RESULTS
We found 4 cases: 2 males and 2 females with normal prenatal findings. The histological diagnoses were 2 mesenteric immature teratoma, 1 hepatic haemangioendotelioma and 1 diffuse hepatic angiosarcoma. In the first three cases the masses were completely surgically removed by laparotomy at 8,14,2 days of life, respectively. The last patient, aged 16 days, died 2 days after initial decompressing surgery by laparostomy. SNAP II/PELOD scores were: 0/11;0/11;5/12 and 64/13 for the last patient. We reviewed 1.131 articles. 61 only were pertinent to the subject and concerned 70 cases.

CONCLUSION
To draw guidelines is difficult and a multidisciplinary management is mandatory. When the clinical status is complicated by associated conditions such as acute abdominal compartment syndrome and consumption coagulopathy, the mortality rate is high.

PW19ON07: INCIDENTAL TUMORS IN A PEDIATRIC ONCOLOGIC POPULATION: SINGLE CENTRE EXPERIENCE

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AIM OF THE STUDY

Radiological investigations in pediatric population may reveal findings unrelated to the pathology for which examinations have been performed, such as a mass. The occurrence of incidental findings in pediatric patients remains unknown. This study aims to analyze the incidental solid tumors diagnosed and treated in a single center in the last 10 years.

METHODS

We prospectively collected data regarding oncologic patients from 2008 to 2018.

MAIN RESULTS

15/311 (4,8%) oncologic patients have a solid tumor diagnosed incidentally. Their characteristic are shown in the table. 14/15 patients (93%) of incidental oncologic group are alive (one patient died due to inhalation of a foreign body).

CONCLUSIONS

Incidental discovery of a solid tumor in pediatric age is rare. Trauma, as confirmed in our population, is the most frequent cause for a child to undergo radiological investigations such as CT or MRI. Recurrent respiratory tract infections and malformations represent the other group of diseases for which patients are screened radiologically. Diagnosing a tumor when not yet symptomatic can improve the outcome, as observed for our patients. The heterogeneity of our population affected by solid incidental tumors does not allow us to formulate surveillance hypotheses.

PT	SEX	AGE	PATHOLOGY	RADIOLOGICAL EXAMS	TUMOR SITE	TREATMENT	HISTOLOGY
1	F	11	ABDOMINAL BLUNT TRAUMA (CAR ACCIDENT)	US SCAN CT SCAN MRI	PANCREAS	SURGERY	PSEUDO-PAPILLARY TUMOR
2	M	16	ABDOMINAL PENETRATING TRAUMA	CT SCAN	RETROPERITONEAL SPACE	SURGERY	PARAVERTEBRAL GANGLIONEUROBLASTOMA
3	F	11	ABDOMINAL BLUNT TRAUMA (CAR ACCIDENT)	CHEST X-RAY CT SCAN MRI	MEDIASTINUM	SURGERY	THYMOMA
4	M	11	ABDOMINAL BLUNT TRAUMA (BICYCLE ACCIDENT)	US SCAN	INTRAVESICAL	CYSTOSCOPIC REMOVAL	PAPILLOMA
5	F	14	ABDOMINAL BLUNT TRAUMA (CAR ACCIDENT)	US SCAN MRI	INTRAVESICAL	CYSTOSCOPIC REMOVAL	PAPILLOMA
6	M	13	ABDOMINAL BLUNT TRAUMA	US SCAN MRI	RETROPERITONEAL SPACE	SURGERY	NEUROBLASTOMA INTERMIXED
7	M	7	PNEUMONIA	CHEST X- RAY ABDOMINAL US SCAN MRI	RETROPERITONEAL SPACE	SURGERY	PARARENAL NEUROBLASTOMA
8	F	4	PNEUMONIA	CHEST-X- RAY	THORACIC MASS	SURGERY	LIPOBLASTOMA
9	F	4	ASTHMATIC BRONCHITIS	CHEST X-RAY	MEDIASTINUM	SURGERY	THERATOMA
10	M	AT BIRTH	CPAM	MRI	ABDOMEN	OBSERVATION	NEUROBLASTOMA 4S
11	M	1	MULTICYSTIC KIDNEY FOLLOW-UP	US SCAN MRI	ABDOMEN	SURGERY + CTX	NEUROBLASTOMA
12	F	10	MELNICK-NEEDLES SYNDROME FOLLOW-UP	CHEST X-RAY MRI	THORACIC MASS	SURGERY	THORACIC GANGLIO NEUROBLASTOMA
13	M	4	OBESITY	US SCAN MRI	RETROPERITONEAL SPACE	SURGERY	GANGLIONEUROBLASTOMA
14	M	9	TEMPERATURE AND ABDOMINAL PAIN	US SCAN	RETROPERITONEAL SPACE	SURGERY	PARAGANGLIOMA
15	F	12	ABDOMINAL PAIN	US SCAN MRI	INTRAVESICAL	CYSTOSCOPIC REMOVAL	PAPILLOMA

PW19ON08: LAPAROSCOPIC MANAGENENT OF IMMATURE TERATOMA (STAGE I) WITH PRESERVATION OF MACROSCOPIC HEALTHY OVARIAN TISSUE

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AIM OF THE STUDY
To present our experience for the last 9 years in the laparoscopic approach of the stage I immature ovarian teratoma with healthy tissue salvage.

METHODS
From the year 2010 **to** 2018 five cases referred to our department with immature teratoma presented with acute abdominal pain. The ages ranged from 4 -13 years old(mean:8.5). Ultrasound revealed ovarian torsion in two cases and the rest without torsion. We continued with MRI that confirmed teratoma. In all of them laparoscopic excision was performed with ovarian tissue preservation. Intraoperative time was from 40-65 min(mean 52.5). The mean hospitalization time was 1-2 days(1.5) and all cases discharged in good clinical position .

MAIN RESULTS
Preoperative imaging such as ultrasound and MRI revealed teratoma and histologic examination immature teratoma dissected on healthy borders.
The only increased tumor marker was a-fetoprotein that was normalized after surgery.

Follow up with tumor markers and abdominal imaging such as US and MRI every six months for the first five years and then yearly shows no relapse and normal ovarian tissue growing.

CONCLUSIONS
Immature ovarian teratomas are rare germ cell tumors and its management is still in debate.
We propose laparoscopic ovarian tissue sparing management for the preoperatively diagnosed ovarian tumors at stage I without rupture at macroscopically healthy borders, using endobag for extraction.
Follow up every six months for the first five years and then yealy with tumor markers and abdominal imaging appeared to be a safe approach with no peritoneal dissemination and no relapse.

PW19ON09: MINIMALLY INVASIVE SURGERY IN NEURAL NEOPLASIES IN THE CHILDHOOD

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PURPOUSE
The aim of the paper is to describe the experience of our centre with minimally invasive surgery (MIS) in neural neoplasies in the childhood.

METHODS
It is a descriptive, retrospective study of patients diagnosed with neural neoplasia (neuroblastoma and neuroganglioma) on whom MIS technique surgery has been performed between October 2012 and December 2017.
The selection criteria were stablished for patients without imaging-defined risk factors (IDRFs) and with a non-disseminated tumor.
Patients with a different diagnosis than neural tumor and with IDRFs were excluded from the study.

RESULTS
The study comprises 19 cases (6 female and 13 male) with a median age of 47 months. According to International Neuroblastoma Risk Group Staging System (INRGSS) classification 9 cases were in L1 stage, 6 in L2, 2 in M and 2 in MS. Laparoscopy was used in 14 patients (12 adrenal and 2 abdominal tumors) and thoracoscopy was used in 5 cases.
In 4 of the 19 patients (21%) conversion to open surgery was needed (3 in laparoscopy and 1 in thoracoscopy due to fibrosis in 2 cases, and vascular structures entrapment in the other 2).
There were no surgical complications, achieving full exeresis in all cases. Three cases showed post surgical adverse effects grade I and II according to Clavien-Dindo classification.
After a median of 27 months of follow up, two patients showed disease progression without local recurrence.

CONCLUSIONS
In conclusion, MIS are useful techniques for the surgical exeresis of non-disseminated neural tumors without IDRFs.

PW19ON11: WHAT HAS CHANGED IN CHILDHOOD THYROID CANCER SURGERY?

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AIM
Objective of this study was to investigate the characteristics of the patients with thyroid cancer, change in treatment strategy and outcome over the years.

CASES AND METHODS
The files of the patients, treated between 2006-2018 were evaluated retrospectively. The patients were divided into two groups according to surgical technique and intraoperative nerve monitorization (IONM) (Group 1: 2006-2011; Group 2: 2012-2018). The demographic characteristics of the patients, surgical methods, complications were evaluated.

FINDINGS
Twenty-seven patients (21 females, 6 males) with a mean age of 11 years (2.5-17 years) were evaluated. Twentytwo patients had papillary carcinoma, 3 follicular carcinoma and 2 diffuse adenomatous hyperplasia.

In Group 1, 7 patients underwent total thyroidectomy and bilateral neck dissection, 2 patients subtotal thyroidectomy and one patient nodular excision. Two required secondary total thyroidectomy. Perioperative nerve damage was identified in one patient and transient vocal cord paralysis in another. 6 patients had transient hypoparathyroidism and 1 patient had chylous leakage.

In Group 2, 13 of the 17 patients had primary disease and 4 had secondary relapse after surgery. In patients with primary disease we performed total thyroidectomy (n=8) and total thyroidectomy + bilateral neck dissection (n=5). Four patients with relapse required neck dissection. Eleven patients underwent IONM. We observed transient hypoparathyroidism in 4, permanent hypoparathyroidism in one and chylous leakage in one case. Average follow-up was 5.3 years (2 months-12 years).

CONCLUSION
Total thyroidectomy and/or neck dissection is the gold standard in thyroid cancer surgery. Use of IONM decreases complication rates and enables safer surgery.

PW20GE01: NEW TOOLS FOR SEXUAL HEALTH SUPPORT IN PATIENTS WITH COLORECTAL AND ANORECTAL MALFORMATIONS; AN UNDERESTIMATED ISSUE

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AIM
This study aimed to empower healthcare professionals to provide sexual health support for patients with colorectal and anorectal malformations.

METHOD
A participatory study was conducted in the Netherlands. After obtaining IRB approval, patients were recruited via three patient organizations and three medical centers. Professionals from seven different disciplines and six different centers joined the study. First, an inventory was made on patients' and professionals' needs regarding sexual health support. In total, 22 interviews, three online focus group discussions (n=24) and a survey (n=47), were conducted. For analysis, the empowerment theories of Kanter (1977) and Spreitzer (1995) were used. Secondly, four work sessions (n=10) with patients and professionals were organized to translate needs into empowerment materials.

MAIN RESULT
Various barriers were brought forward for delivering sexual health support. 88% of the patients indicated that they did not discuss their sexual problems with professionals, because they (1) do not feel safe or ashamed or (2) do not know who to contact. Besides, healthcare professionals indicated they experience difficulties in delivering sexual health support, because (3) sexual health problems are not detected (59%), (4) they lack knowledge and skills to discuss sexual health problems (69%) and (5) they lack the time to deliver this support (34.4%).

CONCLUSIONS
To overcome barriers to deliver sexual health support, a website and handbook are currently developed. The website informs patients; the handbook empowers professionals by: (1) increasing knowledge; (2) improving skills to semaphore sexual problems and discuss sexual health and (3) offering tools to embed the support in current processes.

PW20GE02: ABERRANT MUSCULAR HYPERPLASIA OF THE HAND AND PIK3CA RELATED OVERGROWTH SPECTRUM DISORDERS. A CASE SERIES STUDY

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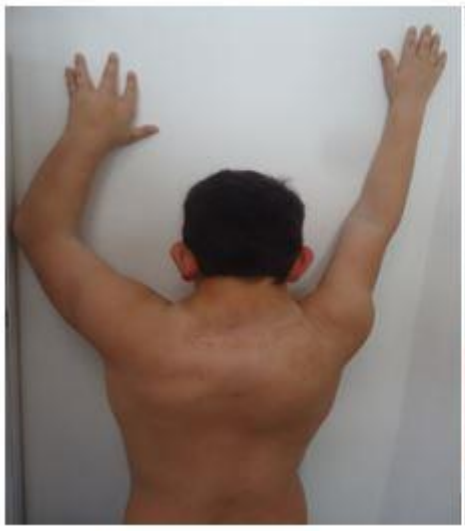
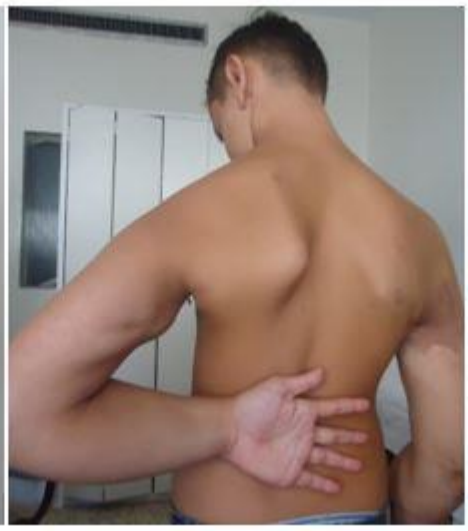
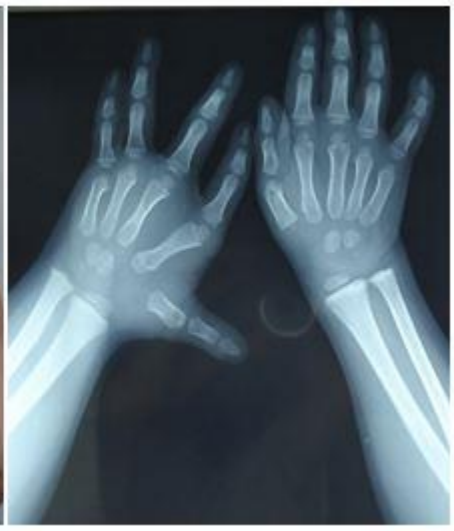
AIM OF THE STUDY
Congenital muscular hyperplasia of the hand is a rarely described entity, characterized by the presence of aberrant or accessory muscles in the hypothenar eminence, which has been always reported as sporadic anomaly in the medical literature. We present 4 patients with aberrant muscle hyperplasia in the context of PIK3CA related overgrowth spectrum (PROS) disorders

METHODS
A series of cases followed at our institution between 2008 and 2018, with a phenotype characterized by aberrant muscle hyperplasia of the hand in the context of PIK3CA mutations have been reviewed.

MAIN RESULTS
Four children (three boys and one girl) with aberrant muscular hyperplasia in the hypothenar eminence associated with ulnar deviation of the metacarpo-phalangeal joints showed associated anomalies. All patients presented with the ipsilateral upper extremity overgrowth. The left side was affected in three patients. Massive cervico-thoracic lypomatosis was presented in one patient and a large combined capillary-venous-lymphatic malformation was observed in the other three patients. Genetic studies revealed PIK3CA mutation in all patients.

CONCLUSIONS
Aberrant muscular hyperplasia of the hand is a well-recognized entity not previously described in association with PIK3CA spectrum disorder in the pediatric population.

PW20GE03: INITIAL EXPERIENCE IN BURNIA TECHNIQUE FOR THE TREATMENT OF INGUINAL HERNIAS IN GIRLS

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AIM OF THE STUDY
Minimally invasive surgical techniques are increasingly applicable in pediatric patients. We present our initial experience in the use of "BURNIA" technique (cauterization of the deep inguinal ring) in girls.

METHODS
Retrospective review of girls with diagnosis of inguinal hernia, operated according to "BURNIA" technique between January 2017 - December 2018.
The surgical procedure is performed under direct vision with 5mm-0º pleuroscope with 3mm working channel introduced by umbilical port. A 3mm dissector is introduced by the working channel and is used to burn the patent processus vaginalis. In the case of contralateral patent peritoneovaginal duct, it was repaired by BURNIA technique in the same surgical act.

MAIN RESULTS
34 BURNIA procedures were performed in 22 girls on an outpatient basis. Mean age was 5 years. 12 cases were unilateral and 11 were bilateral. In six patiens the preoperative diagnosis was unilateral, nevertheless cotralateral defect side was diagnosed and treated. In one of the cases a concomitant hepatic biopsy was performed. Mean operative time was 12 minutes and 17 minutes in unilateral and bilateral cases respectively. At the beginning of our learning curve we had 1 conversion to open herniorrhaphy. Mean follow-up was 16 months.

CONCLUSION
BURNIA is a feasible technique. It allows intraoperative diagnosis and repair of contralateral defects, and the concomitant treatment of others procedures in the same surgical act. Under our initial experience, the learning curve is fast and has good functional and aesthetic results, without visible scars.

PW20GE04: THE ROLE OF PEDIATRIC SURGEONS IN THE ERA OF REFUGEE CRISIS: A SINGLE CENTER EXPERIENCE

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AIM OF THE STUDY
Since the beginning of the refugee crisis, more than 1.000.000 people have crossed Greek borders. Almost one third is estimated to be children and teenagers, while, about 64.000 have settled in Greece. The aim of this study is to present the demographic and medical characteristics of the refugee children that needed hospitalization in our pediatric surgical department.

METHODS
Refugee patients' records from January 2015 to December 2018 were retrospectively examined. Demographics, diagnosis, need for operation, type of operation- emergency or elective- and outcome were recorded.

MAIN RESULTS
A total number of 118 refugees, 82 boys and 36 girls, were hospitalized. Patients' age varied from one month to 14 years. 55 (47%) were Syrian, 21 (17%) Afghan, 19 (16%) Iraqi, 15 (13%) Nigerian and 8 (7%) of other origin. Among admissions, 40 (34%) were scheduled and 78 (66%) emergency. Diagnoses on admission are presented in figure. The most common elective operations were ritual circumcision, inguinal hernia repair and orchiopexy. Of 31 patients who presented with abdominal pain, 11 (35%) underwent appendicectomy; half of them (6) had complicated appendicitis. Of 32 children with head or other injuries, 11 (34%) were car accident victims.

CONCLUSIONS
Firstly, admission diagnoses during the first two and last two years of crisis, show that, as refugees were gradually integrated, the percentage of scheduled operations increased from 23% to 41% of total admissions. Secondly, records reveal a relatively high rate of complicated appendicitis, which might signify a difficulty in accessing a specialist.

Diagnosis	n (%)
Abdominal pain	31 (26%)
Head injury	18 (15%)
Other injuries	14 (12%)
Soft tissue inflammation	3 (2,5%)
Burn	3 (2,5%)
Acute scrotum	2 (2%)
Complicated pneumonia	1 (1%)
Scheduled operations	40 (34%)
Other causes	6 (5%)
Total	**118 (100%)**

Admission diagnosis.

PW20GE05: CLINICAL PRESENTATION AND TREATMENT OUTCOMES IN CHILDREN WITH A VASCULAR MALFORMATION IN THE LIP REGION

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AIM OF THE STUDY
Patients with a vascular malformation in the lip often suffer from both functional and aesthetic symptoms, and treatment is impeded by the anatomical features. This study evaluates symptoms and treatment outcomes in children with a vascular malformation at this particular location.

METHODS
A retrospective study was conducted of all children (<18 years), treated for a vascular malformation predominantly in the lip region at a tertiary referral center between 2011 and 2018. Charts were reviewed for patient demographics, symptoms, lesion characteristics, treatment and clinical outcomes. Clinical response was determined on a scale from 0-3 (no - good response). Patients with and without complications were compared.

MAIN RESULTS
During the study period, 126 embolizations were performed on 24 children. Eleven children (46%) also underwent surgical excision. At baseline, patients reported lesion-related swelling (n=23), pain (n=9), wounds (n=6) or functional problems (n=7). Table 1 shows the clinical characteristics and treatment outcomes. A total of 19 procedure-related wounds were reported in ten patients and three patients developed hypesthesia. On patient level, those with a complicated treatment course underwent more procedures, more often had an extensive lesion and had a lower clinical response (Table 1).

CONCLUSION
These data underline the complexity of treatment for vascular malformations in the lip: most patients need multiple procedures and treatment modalities, complications occur frequently and clinical responses vary. Imaging is important to determine the extent of the lesion, because patients with an extensive lesion require more procedures and have a higher risk of complications.

Table 1: clinical characteristics and treatment outcomes

	Total	Complication +	Complication –	
Total number of patients	24	11	13	
Total number of embolizations	126	17	109	
Total number of procedures incl. surgery	140	22	118	
On patient level				p-value
Number of embolizations (median, range)	4 (1-17)	6 (3-9)	2 (1-8)	**0.007**
Total number of procedures (median, range)	4.5 (1-18)	7 (3-10)	2.5 (1-8)	**0.006**
Subtype				
Arteriovenous	5	1	4	0.327
Venous	16	9	7	0.211
(veno)Lymphatic	3	1	2	1.000
Anatomical location				
Isolated in the lip	17	5	12	**0.023**
More extensive	7	6	1	**0.023**
Clinical response				
mean ±SD	2.33 ±1.0	1.78 ±0.97	2.75 ±0.87	**0.026**
median, range	3 (0-3)	2 (0-3)	3 (0-3)	**0.012**
On procedure level				p-value
Subtype				
Arteriovenous	28	2	26	0.246
Venous	106	19	87	0.282
(veno)Lymphatic	6	1	5	1.000
Anatomical location				
Isolated in the lip	82	10	72	0.174
More extensive	58	12	46	0.174
Embolic agent				
Ethanol	38	5	33	0.942
Aethoxysclerol/foam	57	7	51	0.666
Combination of embolic agents	23	4	19	0.513

PW20GE06: INITIAL EXPERIENCE IN SINGLE PORT LAPAROSCOPIC EPIGASTRIC HERNIORRHAPHY IN CHILDREN

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AIM OF THE STUDY
The repair of an epigastric hernia involves a transverse incision leaving a visible scar which is not aesthetic. We describe our novel uni-port laparoscopic technique.

METHODS
Six epigastric hernias were corrected over a period of 4 months. Preoperatively, the skin area of the epigastric hernia is marked. The patients are placed in supine position. The monitor is over the patient's head.
Necessary equipment: 5 mm trocar, 5 mm telecoscope with working channel, 3.5 mm laparoscopic dissector and 3/0 strand braided non-absorbable suture with double needle.
Pneumoperitoneum is created with an open technique. The fatty tissue of the parietal peritoneum must be resected.
A small puncture is made on the marked skin, where we insert one of the needles of the 3/0 suture into the abdominal cavity, which is retrieve through the trocar. The same is done with the other end of the suture, so both ends of the suture are outside the abdominal cavity. An extracorporeal sliding knot is made to close the defect.

MAIN RESULTS
Four girls and two boys were operated. The average surgical time was 21 minutes. Two patients had umbilical hernias that were treated at the same surgical act. There were no intra and postoperative complications. All patients were discharged on day of surgery. In the follow up the aesthetic result was excelent.

CONCLUSIONS
Although being a small sample, the results are encouraging, with less operative time, without intraoperative complications, and no recurrence at the moment, with an easily reproducible laparoscopic technique.

PW20GE07: PRENATAL OVARIAN TORSION: DIAGNOSIS AND MANAGEMENT IN THE NEWBORN

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AIM OF THE STUDY
Prenatal ovarian torsion (POT) is a clinical condition that has been described before, but is little known and up until now lacks clear guidelines on management. Prenatal discovery of an abdominal mass or cyst can lead to a lot of stress and anxiety with parents. Knowing that POT is a benign condition with marked sonographic-pathologic correlations, our aim is to define the clinical entity of a POT with the largest population to date and set up clear guidelines on its management.

METHODS
We retrospectively collected data from three different paediatric surgical units over a period of 10 years (between 2008-2018). All patients treated for POT were included. Radiological imaging as well as clinicopathological information was collected and correlated with our diagnostic criteria.

MAIN RESULTS
We recovered data from a total of 35 patients. A fluid-debris level on sonography was shown to be a specific feature of torsion and was present in all cases. All patients underwent laparoscopic resection of the cyst at a mean age of 73 days. Upon laparoscopy, 16 patients showed signs of adhesions to the cyst. Pathological findings showed the lack of any remaining ovarian tissue in all of the cases.

CONCLUSIONS
Prenatal ovarian torsion is a condition with distinctive radiological features, the main being a fluid-debris level on sonography. Laparoscopic resection of the cyst has proven to be safe and should be considered in all patients diagnosed with POT.
Approval was obtained from the local ethics committee.

PW20GE08: PEDIATRIC OVARIAN TORSION AND OOPHOROPEXY: 10 YEARS EXPERIENCE IN A SINGLE CENTRE

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AIM OF THE STUDY
Ovarian torsion (OT) is a rare condition in pediatric population and clear guidelines about its management, as well as timing and contraindication for oophoropexy (OP), do not exist yet.

Methods: A retrospective case series was conducted in our database, from January 2008 to June 2018, to identify pediatric patients with OT.

MAIN RESULTS

We identified 87 patients with OT, mean age 9 years (range 0 - 14 years). 40 of 87 patients (46%) with the presence of adnexal mass, 47 of 87 patients (54%) without adnexal mass; 4 of 87 (4,6%) had recurrent OT. The rate of recurrence was the same in the group with torsion without an adnexal mass and in the group with an adnexal mass. 13 of 87 (13,4%) underwent OP. The mean age of patients with OP was 9,4 years. 11 of 13 had OP during their initial procedure, 2 of 13 had OP during their second episode of torsion. OP was performed in all patients with recurrent OT. One of 13 patients had a recurrence of OT of an oophoropexied ovary. There were no complications due to the OP portion of the procedure.

CONCLUSIONS

OP is a safe procedure that do not seem to impair ovarian vitality. Nevertheless, this technique does not exclude OT and its long-term effect about fertility is not well studied yet. Indeed, we recommend performing OP in case of recurrent OT. We do not recommend performing prophylactic OP of the contralateral ovary, especially in absence of adnexal mass.

PW20GE09: RISK FACTORS OF MORTALITY AFTER NEONATAL SURGERY IN A DEVELOPPING COUNTRY

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AIM OF THE STUDY
To identify predictive factors of mortality after neonatal surgery in a developing country.

METHODS
Charts of newborns who underwent surgical procedures under general anesthesia during the neonatal period in our department between 2010 and 2017 were reviewed. Statistical analysis was done using spss version2.0 with p considered significant if <0,05.

MAIN RESULTS

182 cases were included in the study: 41 newborns were premature (<37 weeks of gestation) and 52 weighted less than 2,500 kg. The most commonly diagnosed conditions were esophageal atresia(24%) and small bowel obstruction (19%). Forty four patients (24%) died during hospitalization. The perinatal predictive variables of mortality were prematurity, low birth weight, respiratory distress, duration of surgery> 2hours and surgery for congenital diaphragmatic defect and for necrotizing enterocolitis (table).

CONCLUSIONS

The overall mortality in infants undergoing neonatal surgery is still high and within the prevalence reported for developed country. Establishing the risk factors of early mortality may help clinicians to more adequately manage this high-risk population.

Table: distribution of predictor variables of mortality during hospitalization

Perinatal variables	Mortality:no	Mortality:yes	P-value	Odd Ratio
Term <37 weeks >37 weeks	28 110	19 25	0,003	2,96
Weight: <2,500 kg >2,500 kg	24 114	28 16	<0,0001	8,8
Congenital malformations: no yes	93 45	28 16	0,64	1,18
Respiratory distress at presentation: yes no	112 26	29 15	0,035	2,4
Duration of surgery < 2hours >2 hours	109 29	18 26	<0,0001	5,42
Congenital diaphragmatic defect	14	10	0,04	2,58
Necrotizing enterocolitis	2	4	0,03	6,7

PW20GE10: IMPACT OF EARLY MANAGEMENT OF GASTROSCHISIS

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AIM OF THE STUDY
To Evaluate the impact of early neonatal management in gastroschisis (GS) on short term outcome.

METHODS
Medical records of all patients treated for GS between 2010 and 2018 were reviewed. Epidemiological, delivery, surgical and follow up data were analyzed.
74 patients were referred for GS. 2 of them were excluded due to missing data. A Chi2 and non parametric Mann-Whitney test were used, $p< 0.05$ was considered significant.
Main results: 56% newborns were delivered in emergency. 86% were born by C-section. Median gestational age was 35 SA (25 SA – 37 SA), median birth weight was 2200 g (805 g – 3100 g). Primary closure was achieved in 66% of the cases. Regardless of gestational age, birth weight, nor APGAR score, time between birth and surgical incision inferior to 150 minutes was correlated with lesser bowel matting ($p=0.0023$) and a higher rate of primary closure ($p=0.014$). Primary closure was associated to a lower length of parenteral feeding and hospitalization ($p=0.0009$ and $p=0.00018$). This better outcome was observed in both simple and complex GS.

CONCLUSION
Undelayed surgical management may benefit to all cases of GS.

PW20GE11: THE POWER OF AUDIT WE REDUCED OUR COMPLICATION RATE BY 55%

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AIM OF THE STUDY
An audit at our institution showed 10.8% incomplete excision rate of melanocytic naevi with facial location and operating theatre enviroment identified as risk factors. Results were revealed to the surgical team and this study was launched to assess the change afterwards.

METHODS
Histology results of melanocytic naevi excised at our department between July 2015 and December 2017 were compared to our historical data previously published. The results of the study were aproved for publication by local Bio-Ethical Comission.

RESULTS
A total of 1137 specimens were obtained from 811 patients. Incomplete excision rate was 4.9% (56/1137). Our previous results showed 10.8% (80/739) which gives a reduction of this complication by 55% (5.9 percent points) with p<0001.
Surprisingly the risk factors remained the same as previously with operating theater enviroment reaching 8.9% (15/169) incompletely excised naevi (5.4% and 3.5% from two other sources; p=0.01) and facial location at 23.2% (16/69) comparing to range of 1.6%-5.5% in other locations (p<0.01). Analysis of all the patients in both studies showed that the consultants performing the excision were more likely to have positive margins 9% (60/667) than trainees 6.3% (76/1209) - p=0.03.

CONCLUSIONS
Performing an audit and identifying risk factors resulted in reduction of incomplete excision rate from 10.8 to 4.9 percent. Risk factors remained unchanged while a broader analysis revealed an additional risk factor - consultant performed procedure.

PW20GE12: FIBROADIPOSE VASCULAR ANOMALY (FAVA): THE IMPORTANCE OF A SUITABLE DIAGNOSIS AND TREATMENT. CASE SERIES

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AIM OF THE STUDY
Fibroadipose vascular anomaly (FAVA) is a new kind of vascular malformation first described in 2014. The histological exam generally shows venous dilatations, adipose tissue hyperplasia and fibrous tissue infiltration. It frequently affects the lower and upper limbs. Mutations in the PIK3CA gene have been recently described. Its therapeutic approach differs significantly from that of classic venous malformations (VM), so it is paramount a correct diagnosis.

METHODS
We performed a retrospective study of patients with FAVA diagnosed at our Vascular Anomalies Unit. We analyzed demographic and clinical variables, treatments employed and histopathological findings.

MAIN RESULTS
Nineteen patients were included, with a median age of 26 years (range: 6-23). Eight were males (42,1%) and evelen females (57,9%). The median age at the time of diagnosis was 12 years (range: 0-26). Lower limbs were involved in twelve patients (63,2%), the gastrocnemius muscle being the most commonly affected; upper limbs were involved in 5 patients (26,3%); and trunk in three patients (10,5%). No skin involvement was observed in any of our nineteen patients, which differs from VM. Surgical resection was the treatment of choice in all cases, although 21,4% of patients had received previous treatment with sclerosis, with no response. The histopathological exam found FAVA in all cases.

CONCLUSIONS
FAVA is a vascular anomaly with clinical findings similar to VM. As opposed to VM, surgical resection is the only useful treatment for FAVA. Its precise diagnosis from the beginning is essential to perform a correct treatment and to avoid comorbidity.

	Mean	Standard deviation	Median	Range
Age (years)	25.84	13.53	26	6 - 53
Age at diagnosis (years)	13.50	9.97	12	0 - 26
Size of vascular malformation (mm)	83.10	43.93	74	35 - 170
	Frequency		Porcentage (%)	
Gender				
Male	8		42.1	
Female	11		57.9	
Location				
Lower limbs	***12***		***63.2***	
Gastrocnemius muscle	*10*		*83.3*	
thigh	*2*		*16.7*	
Upper limbs	***5***		***26.3***	
Trunk	***3***		***10.5***	
Treatment with sclerosis previously				
Yes	4		21.1	
No	15		78.9	

PW21MI01: OUTCOMES OF PRIMARY PALMAR HYPERHIDROSIS AFTER THORACOSCOPIC SYMPATHOTOMY

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AIM OF THE STUDY
Primary hyperhidrosis, an important issue in quality of life, affects 1-3% of general population with increased incidence in teenagers. This study evaluated the efficacy and patients' satisfaction after thoracoscopic sympathotomy (TS).

METHODS
Retrospective data analysis of pediatric patients with palmar primary hyperhidrosis that underwent TS between 01/08/2012 and 31/12/2018. TS was performed with double lumen intubation, 2 ports and simple transection of sympathetic chain over 2 or 3 levels (R2-R4, R3-R4, R3-R5). Pre and post-operative hyperhidrosis severity were evaluated by telephone interview, using the Portuguese version of Hyperhidrosis Disease Severity Scale (HDSS).

MAIN RESULTS
20 patients (18 girls; aged 15.6 [11-19] years; weight 53.5 [36-80]kg) with no relevant past medical history, underwent TS. All complained of palmar hyperhidrosis; plantar hyperhidrosis was present in 13 patients. There was neither morbidity nor mortality. Palmar sweating disappeared in all cases. Compensatory hyperhidrosis (CH) occurred in 60% (12/20) of patients; CH was more frequent in those with plantar involvement (9/13, 69%) and those submitted to 2 level section (7/9, 78%). 18 patients (90%) answered the telephone interview. HDSS improved in all patients: pre-operative mean of 3.22 versus post-operative of 1.11. All patients would recommend the surgery to others.

CONCLUSIONS
Thoracoscopic sympathotomy is a safe and effective treatment for primary palmar hyperhidrosis, the teenagers being very satisfied with the outcome.

PW21MI02: IMPACT OF THE THORACIC LEVEL SYMPATHOTOMY ON THE POSTOPERATIVE OUTCOME OF PATIENTS WITH HYPERHIDROSIS

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AIM OF THE STUDY
To describe our experience in the management of hyperhidrosis and to analyze the postoperative outcome of sympathotomy depending on the thoracic level (T).

METHODS
Patients who underwent a thoracoscopic sympathotomy for hyperhidrosis between 2010 and 2018 were retrospectively reviewed. Demographics, type of hyperhidrosis, sympathotomy level, surgical technique, recurrence, compensatory sweating, complications and follow-up time were collected. Plantar hyperhidrosis was excluded.
Association between sympathotomy level (adding T4 to sympathotomy or not) and recurrence, compensatory sweating and complications were analyzed.

MAIN RESULTS
80 patients, 61% females. Mean age at surgery: 14 (8-19) years. Affected areas: 69% palmar hyperhidrosis, 28% palmar and axillary and 3% axillary. T3 sympathotomy was performed in all patients. T3 alone in 11.25%, T2+T3 in 21.25%, T3+T4 in 62.5% and T2+T3+T4 in 5%. Monopolar cautery was used in 52 patients, laser ablation in 28. Mean follow-up time: 10 months. Recurrence was found in 12%. Compensatory sweating was present in 57%. Five complications: one thoracic wall hematoma, two residual pneumothorax and two transitory arm paresthesia.
Logistic regression analysis (controlled by gender, age and technique) showed that not adding T4 to T3 sympathotomy has a tendency to increase the risk of recurrence compared to T3+T4 sympathotomy (OR 8.2; CI 95%:0.7-90.1; p=0,086); adding T4 to T3 sympathotomy showed no increased risk of compensatory sweating (OR 1.25; CI 95%:0.26-6; p=0.781) nor complications (OR 3.9; CI 95%:0.34-44.61; p=0.271).

CONCLUSIONS
Adding T4 to T3 sympathotomy tends to decrease the risk of recurrence without an increased risk of compensatory sweating or complications.

PW21MI03: DIFFERENTIAL ADVANTAGE OF LIVER RETRACTION METHODS IN LAPAROSCOPIC FUNDOPLICATION –COMPARISON OF 3 KINDS OF PROCEDURES

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AIM OF THE STUDY

Liver retraction during laparoscopic fundoplication is important for obtaining an optimal space. There are some kinds of methods, which risk and benefit are unclear. We compared 3 different liver retraction method and evaluated their safety and utility.

METHODS

Forty-four patients who underwent laparoscopic fundoplication in our institution between 2005 and 2018 were included. Patients were classified into three groups (A, B and C) based on the liver retraction method. A: Snake retractor, n=19. B: The hepatic crown suture, n=13. C: The diaphragm gripping by the 2.4mm forceps, n=12. Patients' characteristics, operative data and postoperative outcomes were reviewed based on medical record.

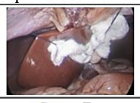
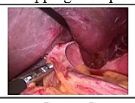
MAIN RESULTS

Patients' characteristics and clinical data were shown in Table 1. The time requiring the liver retraction of group B was significantly shorter than A and C. The operative time of group B and C were shorter than A. There was no significant difference in blood loss and liver enzyme elevation in 3 groups. The serum liver enzymes elevated temporarily, but improved within a week in all groups. C-reactive protein levels were lower in the group B than A and C. In all groups, no serious complications associated with liver retraction were recognized.

CONCLUSIONS

Most convenient methods is grasping diaphragm. But snake retractor and grasper have the confliction with operator's forceps depending of patients' size. Hepatic crown suture do less damage to liver, but require the technique. It is important to select the appropriate method according to operator's skill and patients' body condition such as size and deformity.

Table 1 Patients' characteristics and clinical data

Methods	Snake retractor	Hepatic crown suture	Gripping forceps	*p*-value		
						
Group	Group A	Group B	Group C	A:B	A:C	B:C
No. of Patient	19	13	12			
Patient characteristics						
Age (years)	19.7 ± 13.6	10.0 ± 9.4	24.4 ± 16.7	0.05	0.78	0.07
Sex (M:F)	16 (84%):3 (16%)	10 (77%):3 (23%)	10 (83%):2 (17%)	0.87	0.99	0.92
Height (cm)	130.6 ± 21.8	114.6 ± 25.4	137.9 ± 27.9	0.13	0.16	0.07
Weight (kg)	24.3 ± 12.5	18.0 ± 5.3	26.4 ± 9.9	0.17	0.58	0.05
BMI (kg/m^2)	13.7 ± 3.8	13.8 ± 2.7	13.5 ± 2.3	0.96	1	0.99
Neurological impaired	18 (95%)	13 (100%)	12 (100%)	0.73	0.75	NA
Operative information						
Operative time (minute)	318 ± 102	238 ± 89	228 ± 63	0.05	0.03	0.99
Liver retraction time (minute)	11.7 ± 4.9	14.6 ± 10.7	4.1 ± 4.9	0.99	0.02	< 0.01
blood loss (ml)	41.6 ± 85	18.5 ± 42	25.6 ± 47	0.84	0.99	0.92
Blood test data at post-operation						
AST (U/l)	108.7 ± 94.8	65.6 ± 31.6	112.3 ± 85.5	0.22	0.97	0.36
ALT (U/l)	97.5 ± 75.4	56.1 ± 28.9	86.7 ± 69.4	0.6	0.8	0.32
CRP (mg/dl)	9.4 ± 6.4	3.8 ± 2.5	10.0 ± 6.7	< 0.01	0.9	0.03
Overall complication	0.6 ± 0.6	0.4 ± 0.5	0.8 ± 0.6	0.47	0.31	0.08
Liver enzyme elevation	7 (37%)	4 (30%)	5 (42%)	0.7	0.96	0.59
Pancreatic enzyme elevation	2 (11%)	2 (15%)	2 (17%)	0.91	0.88	0.99
Intra-abdominal abscess	0	0	0	NA	NA	NA
Postoperative mortality	0	0	0	NA	NA	NA
Re-do	0	0	1 (8%)	NA	0.42	0.55
Postoperative hospital stay (days)	13.6 ± 5.1	17.7 ± 9.3	13.0 ± 3.3	0.52	0.97	0.51

PW21MI04: LAPAROSCOPIC OPTIONS IN SUPERIOR MESENTERIC ARTERY SYNDROME IN CHILDREN

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AIM
Superior mesenteric artery (SMA) syndrome refers to the compression of the third portion of the duodenum between the aorta and the SMA, and usually results from weight loss or alteration in spine anatomy. This study reviewed laparoscopic options in SMA syndrome in children.

METHODS
MEDLINE/PubMed were reviewed. Studies in patients under 16 years of age and published in English were included, and selected by 2 independent reviewers. Data was collected for age, gender, comorbidities, symptoms, surgical technique, complications, conversions, recurrence and mortality.

RESULTS
Eleven papers with n=13 patients were included. Mean/median age were 13 years (range 6-16 years) with female predominance (n=9, 69.2%). In n=6 (46.2%), symptoms had began <1 month before diagnosis. Emesis (n=12, 92.3%) and abdominal pain (n=11, 84.6%) were the most common symptoms. Anorexia nervosa was present in n=2, and one patient had recent history of spinal fusion for idiopathic scoliosis. Regarding surgical technique, n=9 cases consisted of duodenojejunostomy with side-to-side anastomosis (one associated with feeding jejunostomy), all but one using stapler; n=2 Strong procedures; and in n=2 patients the technique was not specified. There were no conversions, and n=2 (15.4%) minor complications (self-limited upper gastrointestinal bleed and persistence of vomiting for 48 hours post-operatory). There was no mortality. Median follow-up was 30 weeks (range 2-52 weeks) with no recurrences.

CONCLUSIONS
SMA syndrome is rare in children. The preferred laparoscopic approach is duodenojejunostomy, which can provide definitive relief of the obstruction with minor complications and low recurrence.

PW21MI05: POST-OPERATIVE TOPICAL STEORIDS IN BOYS WITH HISTOLOGICALLY PROVEN BALANITIS XEROTICA OBLITERANS (BXO) REDUCE THE NEED FOR SUBSEQUENT MEATAL DILATATION

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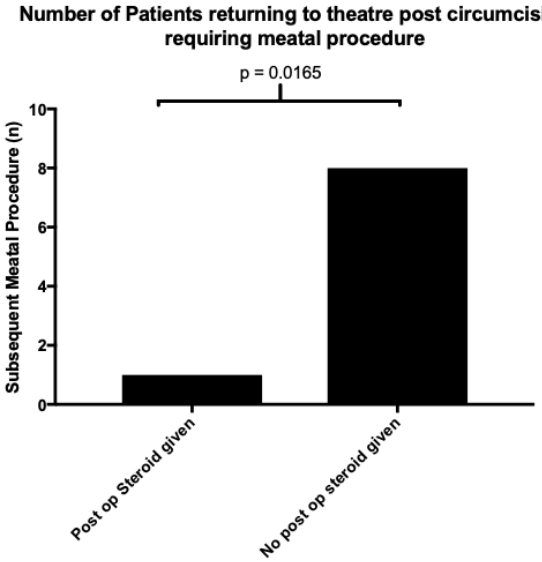
INTRODUCTION
Post circumcision topical steroids may reduce the number of patients with BXO who require subsequent meatal dilatation. However their use has only been investigated in the presence of an abnormal urethral meatus.
The aim of this study is to determine if post-operative topical steroids reduce the need for subsequent meatal dilatation in patients with histologically proven BXO independent of the appearance of the urethral meatus

PATIENTS AND METHODS
We performed a retrospective review of all paediatric patients with histologically confirmed BXO post circumcision. We excluded all those with “chronic inflammation” or “early BXO”.
Patients were divided into groups based on whether post-operative topical steroids were prescribed. The appearance of the urethral meatus at circumcision was recorded.
Primary outcome was progression to subsequent meatal dilatation. Statistical significance was calculated using Fisher’s Exact Test. A P value <0.05 was considered significant

RESULTS
One hundred and seventeen patients with histolologically confirmed BXO were identified between October 2012 and December 2017. Fifty-nine patients were prescribed post-operative topical steroids (50%). Nine patients required subsequent meatal dilatation procedure (8%) and only 1 of these had been prescribed post-operative topical steroids (p=0.0165).
Abnormal meatus was noted in 24 patients (21%). Three patients in this group required subsequent meatal dilatation compared with 6 in the group with a normal meatal appearance (p=0.385).

CONCLUSIONS
Post-operative topical steroids can reduce the need for subsequent meatal dilatation in boys with BXO. The appearance of the urethral meatus at circumcision does not predict the need for subsequent meatal dilatation.



PW21MI06: MINI-LAPAROSCOPY VERSUS CONVENTIONAL LAPAROSCOPY AND OPEN APPROACH FOR URETEROPELVIC JUNCTION OBSTRUCTION TREATMENT

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AIM OF THE STUDY
Open pyeloplasty has been the gold standard treatment for ureteropelvic junction obstruction (PUJO). Since it was first described, the laparoscopic pyeloplasty (LP) has gained popularity. In order to reduce invasiveness, smaller laparoscopic instruments (≤3mm) have been introduced. The aim of our study is to compare 3mm mini-laparoscopy (mLP) and standard 5mm laparoscopy for pyeloplasty.

METHODS
Retrospective chart review of patients who underwent pyeloplasty from 1997 to 2017 at our institution was performed. Demographic data, clinical, surgical and radiological variables were assessed. A multivariate logistic regression analysis was performed in order to identify risks for surgical complications, urinary leak and need for redo-surgery.

MAIN RESULTS
340 pyeloplasties were performed in this period: 197 open, 30 LP and 113 mLP.
Independent risk factors for surgical complications in a multivariate logistic regression model were: LP (vs mLP, OR=3.95;95%CI:1.13-13.8), higher differential renal function (DRF) (each point more increases the risk 6%;95%CI:1%-11%), higher age (every year increases the risk 1.11 times;95%CI:1.002- 1.225). Open surgery, pelvis diameter (PD) or the use of different stents were not risk factors. This model has an 80% PPV and a 92.4% NPV.
LP (OR=4.65;95%CI:1.08-19.96) and higher surgical time (OR=1.014;95%CI:1.003-1.025) are independent risk factors for urinary leak. Higher PD (OR=0.93;95%CI:0.87-0.99) and the use of external stent are independent protective risk factors for urinary leak (OR=0.09;95%CI:0.01-0.72).
We have not found independent risk factors for redo-surgery in a multivariate logistic regression model.

CONCLUSIONS
mLP can be safely and effectively used to perform pyeloplasty in pediatric patients of all ages.

PW21MI07: TOWARD ESTABLISHING NEW GUIDELINES ON THE MANAGMENT OF THE URETEROPELVIC JUNCTION OBSTRUCTON IN CHILDREN: REVIEW OF THE LITERATURE AND META-ANALYSIS

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AIM OF THE STUDY
As the minimally invasive approaches have completely changed the approach of ureteropelvic junction (UPJO), our aim was to review the literature to establish guidelines on that matter

METHODS
We performed a critical review of the literature published between 2003 and 2018 using MEDLINE, COCHRANE and EMBASE databases. The search strategy used the terms “pyeloplasty”, “ureteropelvic junction obstruction”,”Transposition” and “children”.

MAIN RESULTS
50 articles were reviewed. The total of patients included were 10466 . The mean age at operation was 49 months. The indications for surgery were clinical sympltoms (55,87%), renal pelvic anteoposterior diameter higher than 2cm (24,43%), impaired renal function lower than 40% (24,43% or delayed wash out curve on the renal scan (76,02%). A minimally invasive technique was performed in 82,48%: it was a vascular transposition (VT) or a liberation of the junction without a dismembered pyeloplasty(DP) (3,45%) , retroperitoneal DP (7,2%) , transperitoneal DP (76,23%) and a robotic one (16,24%). The VT had a high rate a success (96,35%) when a kincking of the junction is found by a vessel or adhesions.

CONCLUSION
This review recommends a primary laparoscopic exploration to resolve a kicking of the UPJ when a surgical treatment is indicated. DP should be performed if an absence of vidange of the junction is noted preoperatively or as a second line treatment.

PW21MI08: THE EFFECT OF HYDROGENE SULFIDE IN AN EXPERIMENTAL TESTICULAR TORSION MODEL

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AIM OF THE STUDY
We aimed to evaluate the effect of H_2S in testicular torsion.

METHODS
Eighteen male Wistar albino rats were divided into three groups: the sham group, which experienced surgical stress; the I/R group, which underwent a detorsion procedure one hour after the testicular torsion application; and the I/R + NaHS treatment group, which received intraperitoneal injections of NaHS solution following a detorsion procedure. On the seventh day of the detorsion, all left testes were sent to pathology and biochemical processes.

MAIN RESULTS
Microscopic examination revealed I/R group values were significantly lower according to a comparison between the I/R and the I/R + NaHS groups. Myelperoxidase (MPO) activity in the I/R group showed significant increases in testicular tissue compared to the sham group. MPO activity levels, which increase due to the application of H_2S, showed a significant decrease in the I/R + NaHS group. Likewise, advanced oxidation protein product (AOPP) activity placed in the I/R group showed a significant increase in testicular tissue compared to the sham group. AOPP activity levels, which increase following the application of H_2S, showed a significant decrease in the I/R + NaHS group. Glutathione (GSH) levels of the rats in the I/R group showed a significant decrease compared to the sham group, while the GSH levels of the I/R + NaSH group were significantly increased following the H_2S application ($p<0.05$).

CONCLUSIONS
H_2S was effective at preventing the ischemia/reperfusion injury caused by the testicular detorsion procedure in rats.

PW21MI09: EVALUATION OF THE QUALITY OF LIFE (QOL) IN SCHOOL- AGED CHILDREN WHO UNDERWENT BOWEL MANAGEMENT PROGRAM BECAUSE OF FECAL INCONTINENCE

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AIM OF THE STUDY
Fecal incontinence is one of the most annoying and emotionally stressful complications in children. The aim of this study is to evaluate the quality of life (QOL) in school- aged children who underwent Bowel Management Program because of fecal incontinence.

METHOD
Children with fecal incontinence who were referred to our colorectal follow up center and underwent BMP since May 2017 were included. The quality of life was evaluated by the children form of assessment PedsQL4.0. The quality of life was evaluated in the aspects of physical function, emotional aspect, social aspect, and school function, pre and post use of BMP. The assessment`s validity and Cronbach's alpha are 0.84 and 0.82 respectively.

RESULTS
A total of 11 children with fecal incontinence underwent BMP. Five were male and the mean age was 8.5± 1.77 years. The quality of life was in moderate level in both pre and post BMP and there was no significant difference between them (P=0.06). The physical function, emotional and social aspects were improved by the use of BMP (P<0.05). No significant difference was seen in pre and post educational function (P=0.06). Nine mothers were satisfied by the use of BMP.

CONCLUSION
Fecal incontinence disturbs all aspects of quality of life in children and BMP can improve the total psychological aspects

PW21MI10: PERINEAL RECONSTRUCTION FOR FOURTH DEGREE PERINEAL TEARS: A NEW SURGICAL TECHNIQUE USED IN 3 CHILDREN

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AIM OF THE STUDY
To present a surgical technique to repair perineal disruption in children.

METHODS
We reviewed the records of 3 children treated at our institution for perineal disruption. A new surgical technique, based on the posterior-sagittal-anorectoplasty (PSARP) for repair of anorectal malformations, was used. The technique and long-term results are presented.

MAIN RESULTS
Between 2017 and 2019, we treated 3 girls (2 months, 2 years and 8 years of age) with fourth-degree perineal tears secondary to sexual assault. One of them underwent laparotomy and Hartmann colostomy for an acute abdomen. Two underwent wound debridement and closure and only had a stoma fashioned 5 days and 6 weeks post-trauma, respectively. The perineal repair was performed 2, 6, and 7 weeks post-injury. With the child prone in jack-knife position, the edges of the sphincter complex were marked using a nerve stimulator. Stay-sutures were placed on the mucosa of the anterior anal and posterior vaginal walls. Using a needle-tip diathermy, a transverse incision between the two suture lines is performed and deepened until the rectum and the vagina are completely separated. The perineal body is reconstructed using absorbable sutures and an anterior anoplasty and an introitoplasty are performed. The stoma was closed averagely 6 weeks post-reconstruction. At one-year follow-up, all patients have a satisfactory cosmetic outcome, two are still young to be potty-trained and one is fully continent for stools.

CONCLUSIONS
We present a new surgical technique for perineal reconstruction, based on the PSARP, that allows good cosmetic and functional outcomes.

PW21MI11: VALUE OF LAPAROSCOPY IN PEDIATRIC PATIENTS WITH UNDIAGNOSED TUBERCULOUS PERITONITIS

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AIM

Tuberculous peritonitis is a form of tuberculosis mostly seen in the 30-40 years of age. Diagnosis in pediatric cases may be difficult due to rarity in children.It is frequently misdiagnosed as metastatic ovarian tumors. Tumor markers used for ovarian tumors also increase in tuberculosis which further complicate diagnosing.

Laparoscopy combined with biopsy is the best method for accurate and rapid diagnosis in tuberculous peritonitis.
Laparoscopy and biopsy lead to a definitive diagnosis in patients whose aetiology is not identified. We present our four case series showing the importance and value of the laparoscopic approach in diagnosis of tuberculous peritonitis cases, which could not be diagnosed by non-invasive methods.
We had eleven patients diagnosed with tuberculous peritonitis. Four of them could not be diagnosed with non-invasive methods for tuberculosis. They were diagnosed by undergoing laparoscopy combined with biopsy.
In two of them, ovarian tumor markers were found to be high and these patients were followed-up with the diagnosis of ovarian tumor peritonitis carcinomatosis. The definitive diagnosis of four patients was made by laparoscopic examination and biopsy specimen in which caseous necrosis was identified.
Tuberculous peritonitis accounts for about 1% of tuberculosis cases.
Some of the markers such as CA 19-9 often lead to diagnostic confusion, and in these cases laparoscopy can be accepted as the gold standard for definite diagnosis.

CONCLUSION

Beside the providing possibility of visual diagnosis, laparoscopy is less invasive than open surgery and minimizes the risk of fistula. Laparoscopy combined with biopsy can be accepted as the gold standard in the diagnosis of tuberculous peritonitis.

PW21MI12: ANATOMICAL RELATIONS IN INNOMINATE ARTERY COMPRESSION SYNDROME: RETROSPECTIVE CASE-CONTROL STUDY

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ABSTRACT
The aim of the paper is to compare the brachiocephalic trunk (BT) position in relation to the trachea and other anatomical relations in patients with innominate artery compressing syndrome (IACS) and control patients.

Retrospective case-control study of patients diagnosed with IACS in our centre, in whom vascular computerized tomography (CT) was performed. The CT results were compared with those of control patients free of obstructive respiratory pathology, without congenital heart disease and free of deforming thoracic mass. Each case was paired with three controls in similar age groups. The results are expressed by medians and ranges.

Nine cases were included (7M and 2F) with their 27 respective controls (20M and 7F). The BT origin position with respect to the trachea, thought as a clock face, was 1:30 (00:30- 3:00) in cases and 1:30 (00:30-2:30) in controls. No differences were observed (p= 0.72). The relation between anteroposterior/transversal tracheal diameters was 0.44 (0.184-0.6) in cases, 0.885 (0.64-1.16) in controls. Statistically differences were observed (p=0.00001). The sternum-trachea/sternum-vertebra relation was 0.685 (0.6-0.76) in cases, 0.67 (0.49-0.79) in controls. No differences were observed (p=0.75). The angle of thoracic kyphosis was 29º (9º-34º) in cases, 24º (4º-33º) in controls. We found no differences (p=0.45).

In conclusion, we found no differences between the two groups in the BT origin in relation to the trachea. In all cases, the origin was in the left side of the body. Therefore, we question the premise that IACS is due to a more left origin of BT.

PW22MI01: EXPERIENCE WITH FOKER'S ELONGATION PROCEDURE FOR LONG GAP ESOPHAGEAL ATRESIA – MODIFICATION WITH DOUBLE PURSE-STRING TRACTION SUTURES

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AIM
The aim of the study was to present our experience with Foker's elongation procedure for long gap esophageal atresia (LGEA), modified by placing a double purse-string traction sutures.

METHODS
A retrospective study was undertaken from 2015-2018. Six cases of LGEA were treated by Foker's elongation procedure and delayed primary repair afterwards. They were studied considering the age, type of anomaly, gap distance, gastrostomy creation, traction duration, postoperative complications and outcome. Statistical analysis was done by using descriptive methods and Fisher's exact test for small sample sizes.

RESULTS
There were 3 cases with A and 3 cases with C type of esophageal atresia. Gestational age was about 36,8 (34-39) weeks, but average age when traction started was about 22,5 (2-53) days, but after the tracheo-esophageal fistula ligation in the cases of C type. The mean gap was 5,3 (4-6) cm. Four patients had gastrostomy done. Double purse-string traction duration was about 14,8 (11-21) days. There were no complications during the traction and esophageal repair. In one case only, there was a need for additional circular myotomy. There were 2 (33%) cases of postoperative stenosis which demanded 2-6 dilatations respectively, minor leak in 1 (17%) case and gastroesophageal reflux in 4 cases (67%). Nissen fundoplication was indicated in 1 case. One infant (17%) died due to associated major congenital anomalies.

CONCLUSIONS
The induction of the esophageal growth by relaxing double purse-string traction of the longitudinal axis, provides the creation of anastomosis without tension. The imperative is preservation of the own esophagus and timely treatment of complications.

PW22MI02: PERCUTANEOUS ENDOSCOPIC GASTROSTOMY EVOLUTION IN OUR CENTER

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AIM OF THE STUDY
One-time push percutaneous endoscopic gastrostomy with button (PushPEG-B) has been implemented in the last years in most pediatric surgery centers. Our objective was to probe this technique's safety and cost-effectiveness

METHODS
We retrospectively reviewed patients treated in our center with PushPEG-B and compared them to the ones treated with the classic pull technique (PullPEG). The period studied was the last 7 years, when this new technique was introduced. We extracted the data regarding weight/ age at the time of surgery, indication, operative times, postoperative complications and length of stay.

MAIN RESULTS
From 80 percutaneous endoscopic gastrostomy performed, 19 were PullPEG and 58 PushPEG-B. Study population ages ranged from 3,5 months to 21 years-old and weights from 3,5 kg to 47 kg. Diagnosis were desnutrition and dysphagia in neurological impaired children or metabolopathy disease. Median operative time was 21 minutes in PushPEG-B and 24 minutes in PullPEG. Major postoperative complications were present in 4/19 PullPEG and 2/58 PushPEG-B. All the PullPEG required a second intervention under general anesthesia to change the tube . Median postoperative stay was 24 hours in both groups.

CONCLUSIONS
No differences were seen regarding postoperative complications, nor operative times. The length of stay was similar between both groups. We have noticed a tendency in decreasing the age of indication and weight limits, probably because of early condition diagnosis and longer life-expectancy. We conclude the PushPEG-B is the preferable technique, since no second intervention is needed and no differences between groups were seen

PW22MI03: AUTOLOGOUS INTESTINAL RECONSTRUCTIONS IN PAEDIATRIC SHORT BOWEL SYNDROME

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AIMS
to present the results of autologous intestinal reconstructions in children with short bowel syndrome (SBS).

METHODS
54 patients with SBS aged 1 months to 14 years have been treated at Russian Children's Clinical Hospital. Our nutrition team has a multidisciplinary approach that includes autologous intestinal reconstructions (AIR), home parenteral nutrition, drug therapy such as teduglutide etc.

RESULTS
33 patients underwent serial transverse enteroplasty (STEP), 5 children with extreme SBS had repeated STEP procedures. We have developed our own modification of STEP that features intubation of the reconstructed bowel through a gastrostomy, hand sutures only. In case of extreme SBS (<30 cm) STEP is started immediately from the major duodenal papilla. Around 2 weeks postoperatively the intestinal tube is replaced with a low-profile gastrostomy for over-night feeding. We also create anti-reflux valves in the areas of enterocolic anastomoses to reduce bacterial overgrowth.
Eleven children remain off PN 32 months after surgery; fourteen children after AIR continue to receive reduced PN 2-4 times a week - all with reassuring growth and nutritional status.
Applying routine preventive therapy for patients with SBS, we were able to minimize the number of complications such as CVC-related occlusion/thrombosis, intestinal failure-associated liver disease, gallbladder sludge and stones, renal failure and metabolic bone disease. All fatal outcomes (9,3%) were caused by CVC-related blood infections.

CONCLUSION
Paediatric SBS is a complex clinical issue requiring modern non-transplant approach. AIR is an important part of multidisciplinary SBS management that helps to reduce PN, regain enteral autonomy and avoid intestinal transplantation.

PW22MI04: PRIMARY SPONTANEOUS PNEUMOTHORAX IN CHILDREN AND ADOLESCENTS: IS A NON-OPERATIVE MANAGEMENT A VALIDATED ATTITUDE?

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AIM OF THE STUDY
There is no standardized management of primary spontaneous pneumothorax (PSP) in children and adolescents. We aimed to investigate if a primary non-operative management is a validated attitude for management of a first episode of PSP.

METHODS
A monocentric retrospective review of patients under 18 years with a diagnosis of PSP between 2008 and 2018 was performed. Exclusion criteria were traumatic and cystic fibrosis related pneumothorax. Patients were divided into two groups depending on the management, (A) non-operative with chest tube, and (B) surgery with thoracoscopic blebectomy and mechanical pleurodesis. Recurrence and complication rates were generated. Statistical analysis: Student and Fisher tests.

MAIN RESULTS
A total of 41 patients (A, 32 (78%); B, 9 (22%)) was included at a median age of 15 years (9-17) (A, 14 (9-17); B, 15(14-17); p>0.05) with a median follow-up of 30 months (4-99). Median hospitalization stay was 5 days (A, 5 (0.4-13); 5 (3-7); p=0.32). Overall recurrence rate was 27% without any significant differences between the two groups (A, 46%; B, 11%; p=0.24) with 72.7 % occurring within 12 months of the initial PSP (A, 63.6%; B, 9%; p>0.05). Complication rate included hemorrhage (N=2), and was significantly higher in the group B (A, 0%; B, 22%; p=0.04) with grade 2 and 3 Clavien-Dindo complications.

CONCLUSIONS
Despite the trend to a statistical difference between the two groups, an initial non-operative management of primary spontaneous pneumothorax seems a valid attitude with a recurrence rate of 46%. A study to assess risk factors for recurrence should be necessary.

PW22MI05: POSTURAL ASYMMETRY (PA) ANALYSIS USING MUSCLE SPARING TECHNIQUE THORACOTOMY (MSTT) IN ESOPHAGEAL ATRESIA (EA) PATIENTS LONG TERM FOLLOW UP

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AIM OF THE STUDY
Evaluate frequency of possible long-term PA and complaints after MSTT due to (EA) repair.

METHODS
24 patients two-14 years old (in average 5.1) (♀:♂ = **1**5:9) were included with EA operated in MSTT from year 2003-2015. Visual assessments of shoulder, scapular, and pelvic alignments were performed. In asymmetric patients, biplane x-rays (Cobb angle) were performed.
Parent questionnaire evaluated visual changes in posture, pain at rest or during physical exercises, and child exercise habits. Ethics Committee approval - 26/21.12.2017.

MAIN RESULTS
In 22 patients, MSTT was the only operation – 16 patients did not have vertebral anomalies (NVA): 9 - symmetrical, six - scapular asymmetry (±2cm), one - scoliosis. Six patients had congenital vertebral anomalies (CVA): one - symmetrical, two - scapular asymmetry (±2cm), three - scoliosis.
Additionally, two NVA patients had repeated MSTT. Nr.1, MSTT included tracheoesophageal fistula (TEF) closure, gastrostomy; second – gastric replacement of the esophagus (GRO) – scoliosis. Nr.2 - operated four times: MSTT with TEF closure and primary anastomosis; MSTT - TEF and esophageal anastomosis insufficiency; TEF ligation, esophagostomy; GRO – symmetrical.
Questionnaire - 20 parents. NVA group – 17 children: four - changes in posture; zero - pain in spine/or thorax; one - pain during physical examinations; eight – during exercise. CVA group - two noted changes in posture; two - pain in spine/or thorax; one - pain during physical examinations; two – during exercise.

CONCLUSIONS
MSTT cannot completely avoid postural asymmetry. Patients after MSTT should be monitored on possible posture asymmetry.

PW22MI06: HOW WELL DO PRE-OPERATIVE SYMPTOMS PREDICT SUCCESS IN AORTOPEXY AS A TREATMENT FOR TRACHEOMALACIA?

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AIM
Tracheomalacia is flaccidity of the tracheal wall, leading to collapse on expiration. This can result in a variety of symptoms ranging from stridor to acute life threatening events (ATLE). Aortopexy is a commonly used surgical intervention but is not universally successful in alleviating the symptoms of tracheomalacia.

We aimed to determine if any symptoms were more reliable predictors of success of aortopexy than others.

METHODS
All patients undergoing aortopexy between February 2016 and December 2018 were prospectively included. Data regarding pre-operative symptoms, degree of tracheomalacia and post-operative symptoms were recorded. Data were analysed using Fisher's exact test, with $p < 0.05$ considered statistically significant.

RESULTS
Twenty-five patients were included, 21 (84%) male, median tracheal collapse was 88% (range 80 – 95%). Median age at operation was 9 months. Overall 18 (72%) improved following aortopexy. Common presenting symptoms, their frequency and outcomes associated with each symptom are shown in table 1. Apnoea and stridor were most likely to improve following aortopexy. No symptom was found to be an independent predictor of operative success.

CONCLUSIONS
Aortopexy appears to be most effective at improving symptoms in patients presenting with stridor and/or apnoeic attacks. No symptoms were independent predictors of operative success.

Symptoms (n)	**Outcomes**		Fisher's exact
	Improvement	No change	
ATLE (4)	4	0	0.11
Apnoea (11)	8	3	**0.02**
Decreased exercise tolerance (7)	5	2	0.13
Stridor (14)	8	6	**0.04**
Admission to intensive care (7)	4	3	0.28
Recurrent lower respiratory tract infection (7)	4	3	0.28

PW22MI07: RISK FACTORS FOR FISTULA-IN-ANO DEVELOPMENT IN INFANTS WITH PERIANAL ABSCESS

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AIM OF THE STUDY
To review our experience in the management of perianal abscess and to identify risk factors for *fistula-in-ano* development.

METHODS
A retrospective review of infants with perianal abscess between 2010-2018 was performed. Patients older than 1 year and inflammatory bowel disease were excluded.
Demographics, abscess localization, surgical and medical treatment, microbiological culture and outcome were analyzed.
The association between *fistula-in-ano* development and: abscess debridement, associated fistulotomy, abscess recurrence and antibiotics use was analyzed.

MAIN RESULTS
68 patients (98.5% males). Mean age at abscess onset: 3.9 months. Most frequent localizations in lithotomy position: superior left quadrant (38.7%), inferior right quadrant (38.7%). 76.5% of the patients received antibiotics. 48.4% of the patients required surgical debridement, 10% with associated fistulotomy. Microorganisms found: nonspecific gram negative bacteria (59.3%), *Escherichia coli* (29.6%), *Klebsiella pneumoniae* (11.1%). Recurrence was found in 26.5%. 45.6% of patients developed *fistula-in-ano*.
Logistic regression analysis (controlled by age) showed that abscess recurrence has an increased risk of *fistula-in-ano* development (OR 18.54 CI95% 3.07–111.93, p=0.001); abscess debridement tends to increase the risk of *fistula-in-ano* (OR 4.72, CI95% 0.85–26.11, p=0.075); fistulotomy at debridement has a low risk of developing *fistula-in-ano* (OR 0.04 CI95% 0.002–0.668, p=0.026); antibiotic treatment tends to protect against *fistula-in-ano* development (OR 0.89 CI95% 0.01–0.48, p=0.007).

CONCLUSIONS
Recurrence of perianal abscess is a risk factor for *fistula-in-ano* development. Surgical debridement tends to increase *fistula-in-ano* formation, whereas antibiotics tend to decrease the risk.
Associated fistulotomy should be considered when perianal abscess require debridement, preventing *fistula-in-ano* development.

PW22MI08: THE ROLE OF COMBINED FLEXIBLE AND RIGID BRONCHOSCOPY IN THE MANAGEMENT OF PEDIATRIC AIRWAY OBSTRUCTIVE DISEASES

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OBJECTIVES
To assess the rate of combined flexible (FB) and rigid bronchoscopy (RB) performed during the same anaesthetic procedure in a multidisciplinary airway unit of a tertiary referral hospital.

METHODS
Retrospective review of bronchoscopies performed in our unit from 2015 to 2018. The following variables were studied: demographic data, total number of bronchoscopies, number of combined procedures, indications for airway exploration, type of bronchoscopic intervention, and complications.

RESULTS
733 bronchoscopies were included in the study and 233 (31.8%) were combined procedures, FB and RB simultaneously. Indications for combined procedures were: performing some type of therapeutic procedure in 147 (63.1%), calibration of subglottic stenosis in 66 patients (28.3%), improving visualization in 15 (6.4%) and additional diagnostic techniques in 5 patients (2.1%). Interventional procedures included: dilation (31%), lasertherapy (26%), stent placement or removal (19%), foreign body removal (11%), endolaryngeal mold removal (5%), management of granulation tissue (3%), and other procedures (5%). Complication rate was 4%.

CONCLUSIONS
FB and RB are complementary techniques that can be used simultaneously without increasing the risk for the patient. The main advantages are reducing the amount of anaesthetic procedures, decreasing delay in treatment and optimising economic resources.

PW22MI09: DIAGNOSIS AND TREATMENT OF THORACIC OUTLET SYNDROME IN ADOLESCENTS

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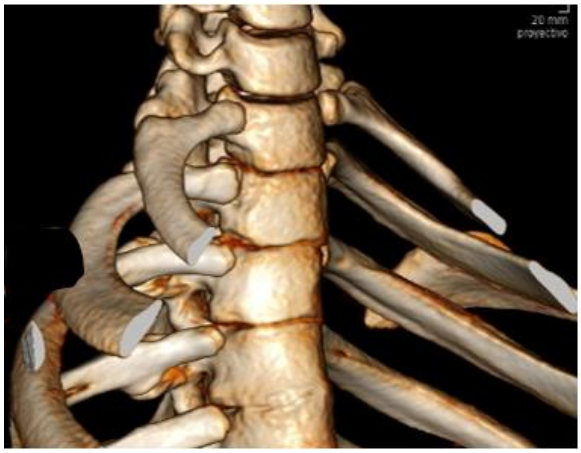
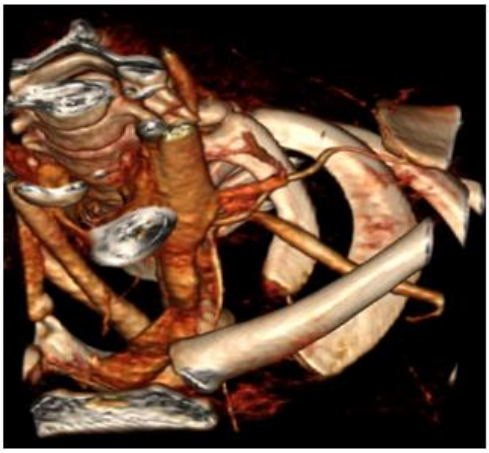
ABSTRACT
Thoracic Outlet Syndrome (TOS) is caused by compression of the brachial plexus and subclavian vessels in their passage to the upper extremity. It's a typical pathology of women between 20 and 50 years old, therefore its finding in children is infrequent. We present our results in the diagnosis and management of pediatric TOS.

Retrospective study of patients diagnosed with TOS between December 2017 and June 2018. Clinical, radiological, surgical and evolution variables were analysed. The results are expressed in arithmetic mean

Five TOS were diagnosed in 4 patients, one of them bilateral. The mean age at diagnosis was 12.5 years (7-15) and there was a delay in diagnosis of 153 days (10-36). Venous (3) and neurological (2) TOS. They presented pain (5/5), edema (4/5), hypoesthesia (3/5), decreased strength (3/5) and cervical pain (2/5). One patient presented with pain associated with sports. The neurophysiological study was normal in three cases. Two patients presented bone anomalies in CT scans. Three surgeries were performed on two patients by supraclavicular approach with resection of the first anomalous rib and scalenectomy. One patient refused the intervention and the other patient remained expectant without reappearance of symptoms. Postoperative follow-up of 9 months (6-12) with progressive improvement of symptoms.

TOS may occur in adolescents who have upper extremity pain and edema. Imaging tests are recommended to detect abnormal anatomical structures. The supraclavicular approach is presented as a safe and effective technique with an improvement of the symptoms in the short time.





PW22MI10: COMPARATIVE OUTCOMES IN THORACOSCOPIC MANAGEMENT OF CONGENITAL DIAPHRAGMATIC HERNIA

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AIM

The feasibility of thoracoscopic repair of congenital diaphragmatic hernia (CDH) has been established. Besides its obvious benefits, role and long-term outcomes in patch repairs are still unknown. We aimed to systematically analyze outcomes of this procedure with patches repairs.

METHODS

Literature was searched on PubMed® using terms "Thoracoscopic", "management", "congenital", "diaphragmatic" and "hernia". Age, ventilation, need for patch, type of patch, conversions, recurrence-rate were analyzed.

RESULTS

6/27 articles met inclusion criteria excluding non-pediatric, non-neonatal cases, reviews. Among 224 thoracoscopically treated CDH cases mean age at birth was 38 weeks (31-41), 11% were premature. Patients were stabilized for surgery by mean 4th day(0-9). Data on n=55 showed that operations were performed on conventional ventilation in n=39 (71%), high frequency oscillation (HFO) in n=8 (14.5%), ECMO in n=8 (14.5%). Repairs were primary n=150 (67%), using patches n=64 (29%), not mentioned n=10 (4%). Type of patch was n=13 (20%) polytetrofluoroethylene (PTFE-Gore-Tex), n=2 (3%) Porcine small-intestinal submucosa (Surgisis), n=49 (77%) unnamed prosthetic mesh. Conversion analyzed in 73 patients was 25% (n=18) with following reasons: poor visualization n=2, technical difficulties n=3, cardiopulmonary instability n=4, opting patch in n=9. Recurrence rate was 15.6% (35/224 patients) and was identified in n=22/150 primary closures (14.7%), n=2/2 Surgisis implantations(100%), n=1/13 PTFE patches (7.7%), n=9/49 unnamed patches(18%).

CONCLUSION

Most thoracoscopic CDH repairs are performed on conventional ventilation. Patch repairs is estimated in 1/3rd cases with use of PTFE grafts being popular. Conversions are found in ¼th patients, with not clearly reported reasons. Recurrence rates are high, estimated to be>15%.

PW22MI11: URETHRAL CATHETERIZATION USING A SOFT AND HYDROPHILIC GUIDEWIRE AFTER CLASSICAL PROCEDURE FAILURE IN CHILDREN

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BACKGROUND
Urethral catheterization is a frequent procedure in paediatric patient management. Congenital malformations and urethral injuries are a challenge for urethral catheterization, specially in new-borns or in cases of anorectal malformations (ARM), iatrogenic urethral injury or hypospadias. We present a blind method using a very soft and hydrophilic guidewire of nitinol of 0,018 " and a perforated Foley catheter adaptated to the patient size.

METHODS
All male patients with a difficult urethral catheterization in 2018 were reported. The indication for the procedure was the failure of the vesical catheterization by the nurse, needing a specialist. We analysed characteristics of the patients, underlying pathology, indications, complications and need of cystoscopy for the placement of the vesical catheter.

RESULTS
Thirty-six patients under 12 years old were studied including: severe phimosis (n=6), repaired hypospadias (n=8), a non-operated hypospadias (n=2), ARM (3), iatrogenic urethral injury (1), posterior urethral valves (2) and new-borns and babies with possible urethral trauma after a catheterization attempt (14). Our technique allowed a definitive catheterization in all patients. Four of them underwent an ultrasound control to confirm catheter location. One patient needed a cystoscopy to confirm urethral injury. Complications were not reported.

CONCLUSIONS
The blind use of a soft hydrophilic guidewire of nilitol allows the vesical catheterization in male paediatric patients, when the procedure is difficult. It prevents the need of cystoscopy, suprapubic cystostomy or rectal tacts.

PW22MI12: PRIMARY ENDOSCOPIC TREATMENT OF OBSTRUCTIVE MEGAURETER

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Endoscopic treatment of primary obstructive megaureter, especially endoscopic balloon dilatation, is used widely at last time. However, there are no clear arguments proving the effects of endoscopy.

The aim of this study was to access the effects of endoscopic dilatation of UVJ with prolog stenting depending on the age of patient, degree of upper urinary tract dilatation, urodinamic disorders and kidney function.

260 patients in the age from 3 month till 10 years with primary obstructive megaureter were treated endoscopically with UVJ dilatation and prolonged stenting. Ultrasound, DMSA and MAG3 dynamic scintigraphy, VCUG were done in all. 160 of them have urinary tract infection or acute obstructive pyelonephritis. In 45 renal function was poor, with its decreasing on 40-60%.

Primary follow up 1-2 years over the treatment shows the improving kidneys function and no UTI in all patients. There was significant improving of upper urinary tract urodynamic in 170, in others the obstructive disorders remained. There were significant correlation between the age of patient and urodynamic rehabilitation- it was improved in 90% infants, nevertheless among the patients elder than 5 years old it was improved only in 10% of them.

There are two different reasons for primary endoscopic correction of obstructive megaureter. At first, this method is a kind of internal urine diversion for kidney function rehabilitation. In another cases it is the primary ureteroplasty, which can repair the ureterovesical junction and improve the urodynamic of upper urinary tract, especially in young children.

PW23CR01: CHALLENGES IN THE MANAGEMENT OF ECHINOCOCCAL DISEASE; DOES GLOBAL EMIGRATION INFLUENCE THE INCIDENCE?

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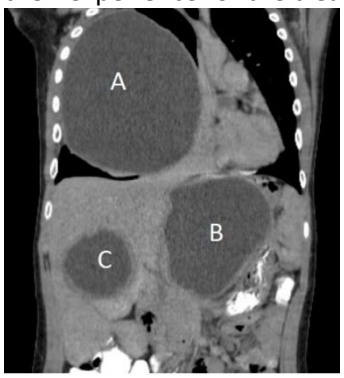
INTRODUCTION
In 2016, 23/27 EU/EEA countries reported 775 confirmed echinococcosis cases with a mean of 0.20 cases/100.000 inhabitants whilst 4 including our country reported none. Echinococcosis was a major problem during the 60ies in our country, currently the infection rates are the lowest in EU. Recently cases are reported increasingly in adult and children because of global migration.
Aim: Due to a complicated case in our hospital, we discuss the problem that pediatric surgeons have "lost" their experience for the treatment of such cases and discuss the consequences.



CASE REPORT
A 12-year-old boy living with his grandparents in Romania, as his mother immigrated to work, visited his mother for holidays, who noticed a mass in his abdomen and a deformity of his chest. The diagnostic examinations revealed echinococcal cysts in 3 different systems: one of about 3L in right thorax [A], one about 1,5L in the left liver lobe[B] and one of about 1L in the right kidney [C].
The thoracic lesion was treated openly. The liver lesion laparoscopically and the kidney lesion is planned as a PAIR (Puncture, Aspiration, Injection, Re-aspiration) technique.

CONCLUSION
Such cases are infrequent and challenging. The lack of medical exposure in such cases constitute a current issue that must be addressed. The awareness of the presence of the disease in the EU paired with continuous medical education as well as better Echinococcosis eradication protocols are mandatory.

PW23CR02: LATENT PERIANAL ABSCESS TURNS OUT TO BE AN EMBRYONAL RHABDOMYOSARCOMA: A CASE REPORT

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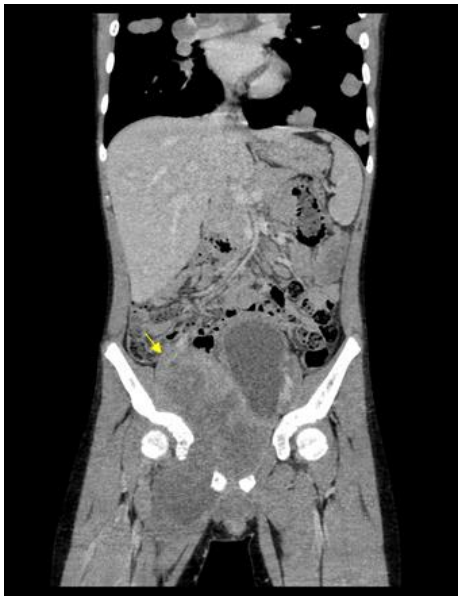
AIM OF THE STUDY
This case report is intended to present an unexpected outcome of a non-improving perianal abscess.

CASE DESCRIPTION
A healthy 12 year old boy checked in the Emergency Room with a one month history of perianal abscess. He referred no improvement despite debridement in 2 occasions and oral and intravenous antibiotic treatment with Amoxicillin/Clavulanic Acid. He stated being in great pain. Additional symptoms were significant weight loss and diarrhoea. Regarding physical exam, he presented a non-fluctuant swollen area of 10 cm of diameter at 9 hours in lithotomy position, with no signs of cellulitis. A computed tomography was performed, informing of an enormous pelvic mass suggestive of rhabdomyosarcoma with numerous metastases (mediastinal, pulmonary, retroperitoneal, peritoneal, subcutaneous and inguinal). In the blood test, lactate dehydrogenase of 5905 UI/L and sedimentation velocity of 24 mm stood out. He was admitted and the next day biopsies were taken, compatible with rhabdomyosarcoma. In addition, bone marrow biopsies were performed and a port was implanted. Imaging study was extended with a magnetic resonance imaging, showing the previous results as well as bone metastases. The patient started chemotherapy and 2 weeks later, positron emission tomography/computed tomography of control revealed a decrease in the size of metastases and the primary tumour.

CONCLUSIONS
Torpid perianal abscesses should make us suspicious, leading us to perform an imaging study in order to characterize the lesion and discard an underlying process such a malignant tumour.



PW23CR03: TESTICULAR TRANSPOSITION IN CHILDREN UNDERGOING EXTERNAL RADIOTHERAPY

Alexandra Varga, Monika Csóka, Tamás Bűdi, Tamás Prokopp, Zsuzsanna Korponay, Zoltán Jenővári
2nd Department of Pediatrics of Semmelweis University, Budapest, Hungary

AIM OF THE STUDY
Gonadal preservation is an important goal in the pediatric oncology. We present a surgical technique of testicular transposition to decrease the side effects of radiotherapy.

CASE DESCRIPTION
A 2-year-old boy diagnosed with prostate rhabdomyosarcoma after the chemotherapy and tumor excision underwent testicular transposition. Through a right suprapubic incision the cord structures and the testis were elevated from the scrotum and the testis was fixed subcutaneously on the font side of the thigh out of the radiation field. This procedure was followed by 28 cycles of external radiotherapy with shielding of the transposed testis.
At the end of the teletherapy the testis was relocated to the scrotum. During the surgical procedure and the followed physical examinations normal testicle size and consistency were detected.

CONCLUSIONS
Testicular transposition to the front side of the thigh during pelvic external radiotherapy can ward off the gonadotoxic effects of radiotherapy. In a future study we would like to accomplish dosimetric analysis to determine the best position of the testis out of the radiation field and follow the transposed and relocated testis with ultrasound examination.

PW23CR04: INTRAVESICAL OXYBUTYNIN AS A DESPERATE MEASURE FOR BLADDER RESCUE IN A NEWBORN WITH POSTERIOR URETHRAL VALVES

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AIM OF THE STUDY

In infants with neurogenic bladder dysfunction, oral oxybutynin has shown to improve bladder behavior. The use of this drug for urgent intravesical instillation at high doses has not been previously described in newborns.

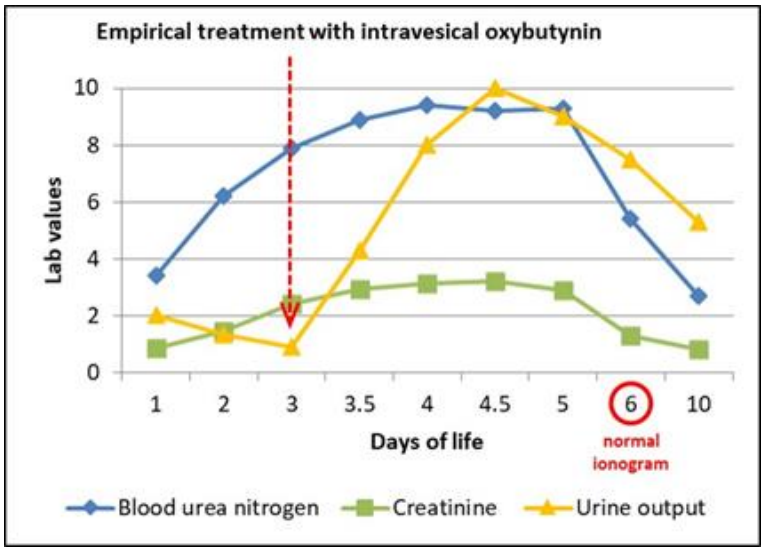
CASE DESCRIPTION

We present the case of a newborn diagnosed with posterior urethral valves with bilateral ureterohydronephrosis and important bladder wall thickening. The bladder catheter placed at birth stopped producing urine at 12 hours of life. In the following three days, bilateral grade V ureterohydronephrosis and renal insufficiency with oligoanuria and severe electrolyte disturbances (hyponatremia, hyperkalemia and increasing 3 mg/dl creatinine) were developed. Sonographically, the bladder was empty with the hypertrophied wall closely clasping the balloon of the bladder catheter. Forced to perform an urgent bilateral ureterostomy we decided to try prior to that, an empirical treatment with intravesical oxybutynin (solution: 5mg of oxybutynin hydrochloride and 20 ml of saline, instilling 4 ml every 4 hours). Twelve hours after starting the treatment, urine output was already 10 ml/kg/h, with complete correction of ionogram after three days.

On the 15th day of life, transurethral resection of valves was performed and we transition to oral oxybutynin (0.3 mg/kg/d), which is currently maintained.

CONCLUSIONS

The ureterovesical junction obstruction appeared to be secondary to detrusor hypertrophy hence it was reasonable to use an anticholinergic to relax the bladder wall. Only the intravesical therapy allowed administrating high doses with fewer side effects. Intravesical oxybutynin is a therapeutic resource to consider in these cases.



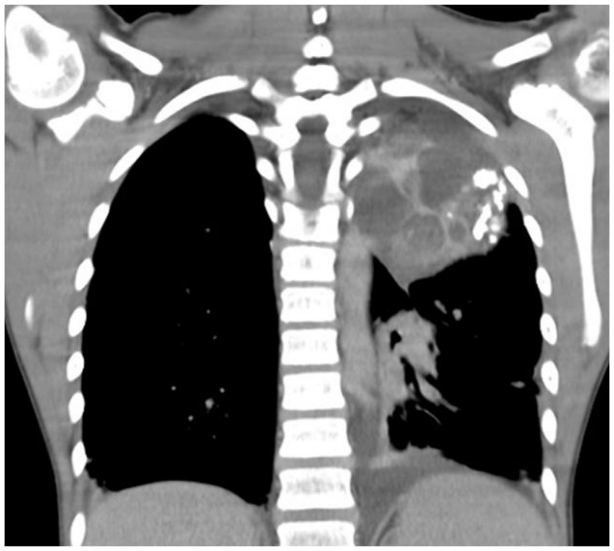
PW23CR05: A LARGE SPORADIC COMBINED LYMPHATIC VENOUS MALFORMATION OF THE LEFT HEMITHORAX

Alba Bueno, María Álvarez, Javier Serradilla, Paloma Triana, Francisco de Borja Nava, Miriam Miguel, Mercedes Díaz, Juan Carlos López-Gutiérrez
La Paz Universitary Hospital, MADRID, Spain

AIM
Combined thoracic lymphatic venous malformations (LVM) are uncommon and difficult to manage as they can present ocassionally with associated enlarged aberrant veins and potential risk of pulmonary thromboembolism. There is little information in the medical literature regarding their appropiate management.

Case Description
A 12year-old boy presented on emergency in the context of a 24hours episode of precordial pain and fever. On X-ray examination a left antero-superior thoracic mass with calcifications was noticed. MRI showed a large vascular mass located in left hemithorax. Angio-CT findings included a gross dilatation of the superior vena cava(17mm) and innominate vein(23mm), without pulmonary involvement. Echocardiogram was normal. Arteriogram was surprisingly normal. After a upper cava vein territory venogram , large veins draining to central venous system were visualized and occluded with 20 mm Amplatzer plugs and coils. Unfortunately, symptoms did not improve and surgical excision of the mass was then performed six months later. Postoperative period was uneventful with the patient remaining asymptomatic and carrying a normal life at 15 months follow-up. Pathology report confirmed both venous and lymphatic endothelium being a part of the malformation.

CONCLUSION
Sporadic combined LVM´s are rarely found in the thorax. They are usually described in patients with PIK3CA related disorders or CLOVES syndrome. Conservative management is recommended in asymptomatic patients. Unfortunately, the risk of thromboembolic events should not be understimated and a more active approach may be eventually considered in patients presenting with pain or coagulopathy as the risk of pulmonary thromboembolism is significant.



PW23CR06: MORGAGNI HERNIA AND UMBILICAL VEIN ABNORMALITY: ASSOCIATION OR ETIOLOGIC RELATIONSHIP?

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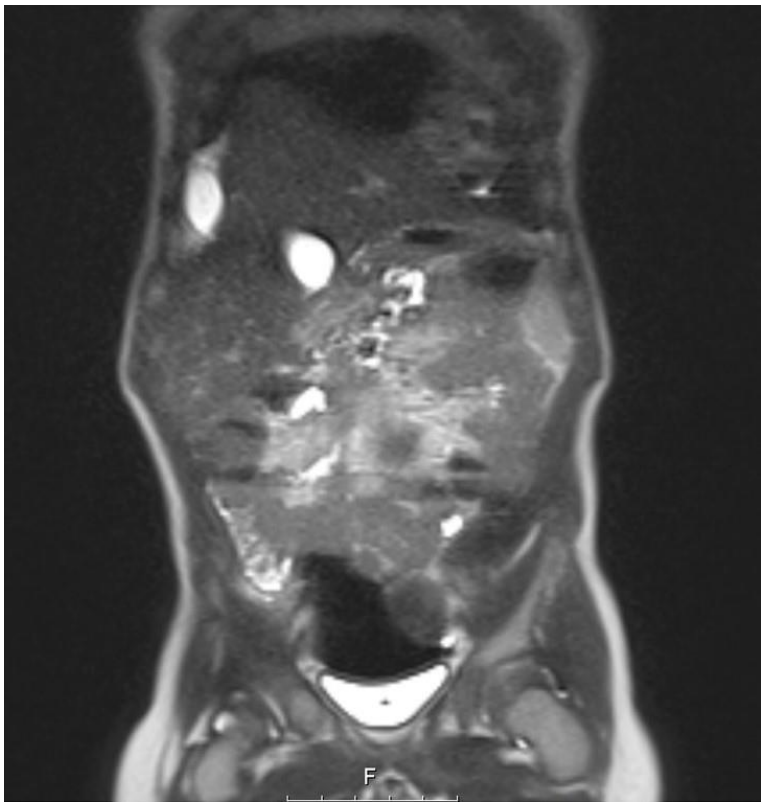
INTRODUCTION
Morgagni hernia is a rare congenital condition, consisting in an anterior diaphragmatic defect. Umbilical vein anomalies are very rare and usually associated with absent ductus venosus (ADV) and other malformations, especially cardiac. Herein, a case of associated Morgagni hernia and umbilical vein anomaly is reported.

CASE REPORT
A 1-year-old boy was diagnosed with a Morgagni Hernia in the workup of a vascular anomaly detected in the prenatal imagiology. Fetal ultrasound had revealed ADV and an abnormal left umbilical vein, coursing through the diaphragm, and draining directly into the right atrium. Fetal MRI confirmed this findings. The neonatal period was uneventful. A Morgagni hernia containing the left hepatic lobe, including the gallbladder, was detected in postnatal MRI (figure). It was successfully repaired by laparoscopic approach.

DISCUSSION
In the rare setting of prenatal diagnosis of ADV and abnormal drainage of the umbilical vein, postnatal imaging should be considered to rule out Morgagni hernia. Although the two anomalies may be coincidental, an etiologic relationship seems plausible, in which the abnormal course of the umbilical vein leads to the diaphragmatic defect. After birth, the involution of the vein opens the way for the herniation of abdominal content.



PW23CR07: CASE REPORT: HOW THE USE OF EMBOLIZATION AVOIDED A LIVER TRANSPLANT

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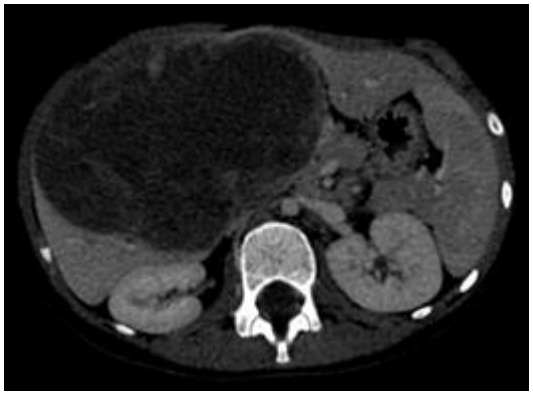
INTRODUCTION
Unresectable liver tumours are among the classic indications for liver transplantation in pediatric patients. However, with the development in tumour embolization techniques and their multiple utilities, a new therapeutic field opens up.

We present the case of a patient with an unresectable hepatic sarcoma who could avoid liver transplantation after embolization.

CASE REPORT
Ten-years-old girl with a large hepatic mass compatible with undifferentiated sarcoma PRETEXT III.



It was treated according to the EpSSG RMS2005 protocol for high-risk tumours without mass decrease. Due to the risk of a small-for-size syndrome after resection surgery, we decided to perform a right portal embolization to induce hypertrophy of the left hemi-liver.

Two months later it was not evidenced any response to the interventional treatment. Consequently, the patient had to be included in the waiting list for liver transplantation. However, after one month we observed a clear decrease in the tumour mass in a control CT scan and the resection could be carried out successfully avoiding the transplant.

After one year of follow-up, the patient has not presented any pathological event.

CONCLUSION

Embolization must be considered as a therapeutic option in cases of unresectable liver tumours, especially in patients at high surgical risk. The broad development of embolization techniques should be encouraged since their use could avoid transplant in selected pediatric patients.

PW23CR08: SITUS AMBIGUOUS AND BILIARY TRACT ANOMALY: AN UNUSUAL CASE

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AIM OF THE STUDY
The association between Situs ambiguous (SA) and choledochal malformation (CM) has been previously described. Herein we report a case of a patient with SA and duodenal obstruction which presented pancreatitis for CM.

CASE DESCRIPTION
A 15 months old male affected by SA with previous history of duodeno-duodenal anastomosis for duodenal obstruction and gastrodigiunostomy for anastomotic dehiscence, was admitted for intermittent abdominal pain. The blood tests and the US demonstrated a pancreatits. The MRCP showed right stomach with left position of pylorus, duodenum, head of pancreas, cystic duct with anterior gallbladder and left IVC with dilatation of the biliary tree of the main pancreatic duct (Fig. 1).

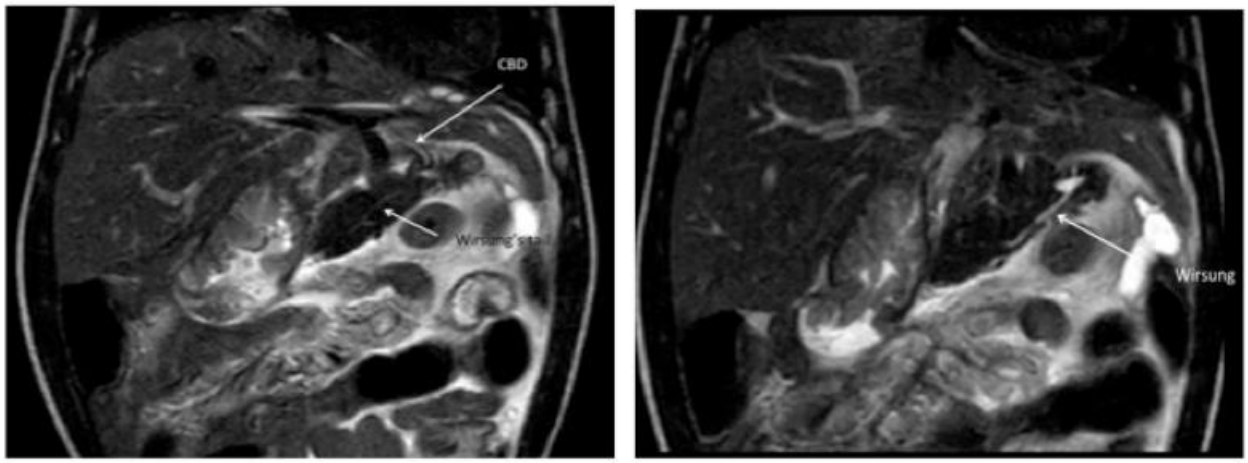

Fig. 1

After 4 weeks of fasting, fat-less TPN, Octreotide and iv antibiotics he was still affected by pancreatitis. In the suspicious that the pancreatitis was due to the biliary tree anomaly, a laparotomy was performed: after duodenotomy the papilla was incannulated, the cholangiogram showed the Wirsung dilatation with bile stasis; the CBD was separated from Wirsung which was widen. A Wirsung stent and a nasobiliary cannula ware positionated. An effective biliary drain in the duodenum was observed and a duodeno-jejunal anastomosis was performed.The postoperative course was uneventful: the patient was feed again and discharged in few weeks. He has currently a free diet, his weight is increasing, he is symptoms free and the blood tests are negative.

CONCLUSIONS
The association between SA and choledochal anomalies is very rare but it represent a diagnostic and therapeutic challenge for the surgeons.

PW23CR09: DUODENAL DUPLICATION COMMUNICATING WITH BILIO PANCREATIC DUCTS: CASE REPORT

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AIM OF THE STUDY
Duodenal duplications account for 5% of all gastrointestinal duplications. We describe a unique case in which duplication communicated with pancreatico biliary ducts.

CASE DESCRIPTION
We report the case of 3-year-old female child with a history of episodes of abdominal pain who presented for fever, vomiting and abdominal pain. The diagnosis of acute pancreatitis was retained in front of elevated lipase levels at 2332 UI/l. The abdominal Computerized Tomography scan revealed pancreatitis with a cystic lesion repressing the pancreatic head and suggesting a duodenal duplication or choledochal cyst. An upper gastrointestinal opacification showed oval-shaped lacunar image located in the second duodenum. Bili-MRI confirmed the diagnosis of a duodenal duplication measuring 4 cm x 3.2 cm repressing the water-ampulla.
At operation, the cyst was intimately related to the second part of the duodenum sharing common wall. A bilious duct was found in the low part of the cyst. The cyst was opened afer catherization of the duct. The content of the cyst was bilious. The Vater papilla was opened into the cyst. We stripped mucosal lining after excising the resectable portion of the cyst. The child was discharged on the fourth postoperative day. Histopathology of the specimen confirmed the diagnosis.

CONCLUSION
Gastrointestinal opacification and MRI were useful for the diagnosis of duodenal duplication which communicates with biliopancratic truct. In case of duodenal duplications in a child with close proximity with pancreatico-biliary ductal systemssubtotal excision of duplication and mucosal stripping may be safe.

PW23CR10: ENDOVASCULAR TREATMENT OF A TRAUMATIC THORACIC AORTIC INJURY IN A PRECIPITATED CHILD: A CASE REPORT

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INTRODUCTION
Blunt traumatic aortic injury in children is a rare but severe condition and frequently associated with concomitant life-threatening injuries. The best therapeutic management is not clear with few reported pediatric endovascular cases exposed in the literature.

CASE REPORT
A 4-year-old patient was transferred to our emergency Unit after a fourth-floor fall. After initial stabilization the CT scan showed the following injuries: a severe bilateral pulmonary contusion with bilateral pneumothorax and pneumomediastinum, multiple rib fractures, a pseudoaneurysm of the thoracic aorta, a right suprarenal hematoma and hepatic laceration and right kidney both grade III. A multidisciplinary treatment sequence was performed and damage control surgery was ruled out due to the hemodynamic status of the patient. An aortic covered stent was placed in the pseudoaneurysm of the thoracic aorta in order to avoid the surgical approach.
Despite the prolonged stay in the Pediatric Intensive Care Unit requiring initially respiratory high frequency support the patient recovered successfully. All traumatic contusions and laceration could be managed conservatively without any sequels.
After 2 years of follow-up, the patient has not required new endovascular or surgical procedures and has not presented any complications.

CONCLUSION
Traumatic aortic injury generally associates concomitant life-threatening injuries, so multidisciplinary approach should be performed in specialized center. The endovascular approach allows the correction of the aortic defect as a minimally invasive technique being a safe and effective option, also in children, although a posterior surgical procedure to change the graft may be required in these cases.

PW23CR11: LOWER URINARY TRACT OBSTRUCTION DUE TO SYRINGOCELE - A MISSED DIAGNOSIS

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INTRODUCTION
Urethral syringocele (or Cowper´s gland dilatation) is a rare cause of urethral obstruction in neonates and young boys which is treatable endoscopically. We report a case of two year old boy with syringocele who was misdiagnosed and recommended life-long clean intermittent catheterization (CIC) for chronic urinary retention.

CASE REPORT
A 2 year old boy presented with continuous dribbling of urine to a regional hospital. His parents reported frequent straining on micturition, with an interrupted stream since birth. Repeated ultrasound scans confirmed a large capacity bladder with thickened wall and no upper urinary tract dilatation. A voiding cystourethrography (VCUG) showed a cranially elongated bladder with trabeculated wall. The boy did not void spontaneously during VCUG and his urethra was assessed on cystoscopy with normal findings. MRI excluded spinal malformation and neurogenic bladder. Finally, despite no clarified diagnosis, CIC was recommended, which he did not tolerate because of pain. Second review of the VCUG and MRI scans at the tertiary pediatric center showed a syringocele. Endoscopic incision of the syringocele restored normal urinary stream. After 3 years of follow-up the boy urinates normally with occasional urgency and persistent enuresis.

DISCUSSION
Syringocele opens by a pin-point opening into the bulbar urethra and progressively gets dilated by antegrade urinary stream. On micturition the dilated cyst causes obstruction. Syringocele can be easily missed on retrograde cystoscopy as the artificial saline stream of the scope flattens the cyst and the pin-point opening is not actively looked for without the knowledge of this pathology.

PW23CR12: HETEROPIC PANCREAS: A RARE CAUSE OF INTUSSUSCEPTION IN CHILDREN

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AIM OF THE STUDY
Heterotopic pancreas is a developmental anomaly defined as pancreatic tissue found on ectopic sites. Intussusception caused by isolated pancreatic heterotopia is extremely rare. Herein, we report cases of secondary intussusception, in which conservative treatment was failed and surgery was performed.

METHODS
We retrospectively collected patients who were treated in the pediatric surgery's department for intussusception caused by pancreatic heterotopia, from January 1986 to November 2018.

MAIN RESULTS
Five patients, 3 boys and 2 girls were investigated. The most frequent symptoms observed were paroxysmal abdominal pain in all cases, vomiting in three cases and blood-stained stools in two cases.Abdominal ultrasound imaging did not show any suspicious images suggesting the possibility of a secondary intussusception. Hydrostatic enema was our first-line therapy for all patients. Hydrostatic reduction failed at the level of the ileocecal valve in three cases and at the level of the hepatic flexure in two cases. No specific findings were detected nor suspected while enema reduction was tried. The diagnosis was done incidentally during the operation in all cases. The heteropic pancreas was found in the jejunum in three cases and in two cases in the ileum. An intestinal resection was then performed with an end-to-end anastomosis was done. Postoperative course was uneventful. The histopathological examination confirmed the diagnosis.

CONCLUSIONS
Although pancreatic heterotopia is a rare congenital lesion, it should be remembered in the differential diagnosis of various gastrointestinal lesions, causing secondary bowel intussusception.

PW24CR01: AN EXCEPTIONAL PRESENTATION OF PERIANAL FISTULA

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AIM OF THE STUDY
Perianal fistula is an infrequent pathology. The majority of cases are diagnosed in men under one year. We present the case of a patient with suspected perianal fistula, another being the definitive diagnosis.

CASE DESCRIPTION
A 10-month-old male referred from another hospital for suspected perianal fistula. History of two urinary infections. In addition, her parents report that, sporadically, at the end of urination, he emits a drop of clear fluid through the perineum. On examination, a small perianal orifice was observed at hour two in the lithotomy position. Abdominal ultrasound: normal. Voiding cystourethrogram shows normal urethra with accessory "Y" urethra with posterior trajectory, ending in perineum. Fistulography confirms the path from the accessory urethra to the posterior urethra. With the diagnosis of urethral duplication, a lambda incision was made in the perineum, after catheterization of orthotopic urethra with Foley-type catheter and heterotopic one with Fogarty catheter under cystoscopic vision, observing heterotopic urethral orifice opening lateral to the verumontanum. Finally the duplicated urethra is removed.

CONCLUSIONS
Urethral duplication is an exceptional congenital malformation. It usually occurs asymptomatically, since the majority end up in a blind fund; although, depending on the anatomy, the patient will have a double urinary stream, urinary infections, urinary incontinence, among others. In the presence of a perianal orifice without precedent of abscess and through which clear fluid is seen, a urethral duplication should be suspected.

PW24CR02: ASSOCIATION BETWEEN BECKWITH-WIEDEMANN SYNDROME AND NESTED STROMAL EPITHELIAL TUMOR OF THE LIVER

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AIM OF THE STUDY
Beckwith-Wiedemann syndrome (BW) predisposes to neoplasm development such as Wilms tumor or hepatoblastoma. Hepatic Nested Stromal Epithelial Tumor (NSET) is extremely rare. We present the fourth case described in the literature of hepatic NSET in a BW patient.

CASE DESCRIPTION
This was a 2 year-old boy with BW, already operated because of an omphalocele and cleft palate. A routine ultrasound of the liver showed a space occupying lesion, initially thought to be a hemangioma. After 6 months of follow up, the lesion had grown. The MRI described a solid lesion, polilobulated, in the hepatic segments VII-VIII (25x24x26 mm), calcifying and homogeneously enhancing. Serial alpha-fetoprotein (AFP) tests were normal. A biopsy was taken and the histology was compatible with NSET. Even though in general this tumor is nonmalignant, pulmonary and lymph node metastases have been described in the literature. For this reason, a right hepatectomy was undertaken uneventfully. Pathology study revealed a lesion of 3x2,7x2,3 cm, non-encapsulated, composed by the typical nests of spindle cells with fusocellular stroma. There where psamomatous diffuse calcifications and focal areas of osteoid formation. Immunohistochemistry for WT1 was positive.

CONCLUSIONS
Although NSET of the liver is extremely rare and more frequently seen in young women, a suspicion has to be risen when a lobulated, well-circumscribed mass with calcifications is found in the right hepatic lobe, with normal AFP levels. The association with BW is exceptional and has been previously described, being this case the fourth one found in the literature.

PW24CR03: IATROGENIC COMPARTMENT SYNDROME SECUNDARY TO BURN DRESSING. A CASE REPORT

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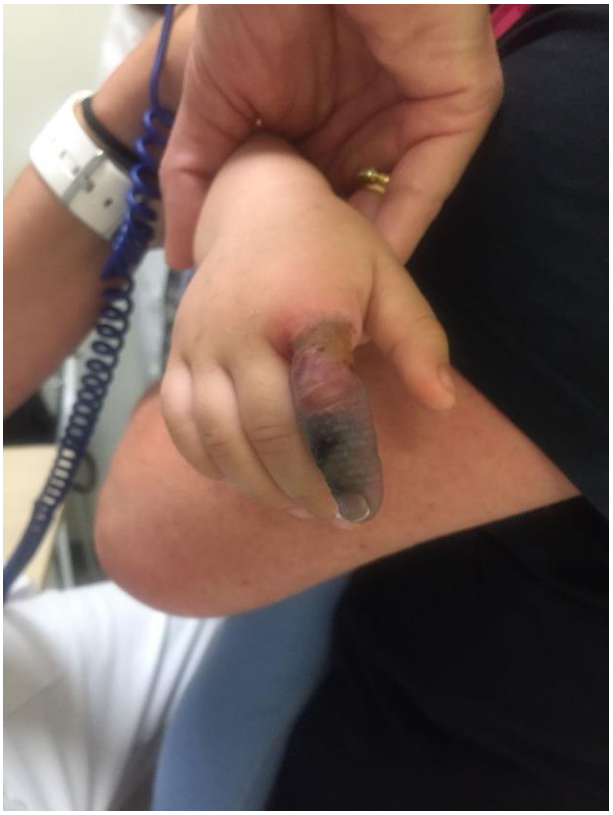
AIM OF THE STUDY
Acute compartment syndrome is an entity that can severely compromise the circulation, function and even viability of an extremity. Occasionally, compartment syndromes can be of iatrogenic origin. We report a severe case of compartment syndrome due to a compressive burn dressing.

CASE DESCRIPTION
An otherwise healthy 2 years-old girl presented at her local health center with a superficial partial thickness thermal burn on the dorsum of the mid phalanx of the second finger of her right hand. A compressive dressing was applied solely to the affected finger. Forty-eight hours afterwards, the patient presented at the emergency room with severe pain of the finger. After removal of the dressing, a circular constrictive eschar was observed at the base of the finger, secondary to ischemia due to the compressive dressing, which generated a significant compartment syndrome with severe vascular compromise of the finger (figure). Emergent lateral escharotomies were performed, with immediate recovery of distal perfusion. One week afterwards, the patient underwent surgical debridement of the burn on the dorsum of her finger and escharectomy of the ischemic eschar at the base. The lesions were covered with partial thickness skin grafts.

CONCLUSIONS
Acute compartment syndrome can lead to severe sequelae, such as the loss of an extremity or body segment. We must take utmost care in all our actions, to avoid any (negligent) act that could lead to severe or permanent damage to our patients.



PW24CR04: AN UNEXPECTED CAUSE OF UROGENITAL BLEEDING IN CHILDREN: URETHRAL PROLAPSE

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AIM OF THE STUDY
Urethral prolapse is a circular protrusion of the distal urethral mucosa from the external meatus. It is usually seen in postmenopausal women and prepubertal black girls but it is rare in children. In this article, we presented a child with urethral prolapse.

CASE DESCRIPTION
8-years-old mentally retarded girl was brought to the emergency room with the suspicion of sexual abuse due to presence of blood in her underwear. The patient was hospitalized with a preliminary diagnosis of sexual abuse. Examination under general anesthesia revealed a hyperemic, edematous, bleeding circular mass in urethral orifice. No additional pathology was found in cystoscopy and vaginoscopy. Urethral prolapse was diagnosed in patients with these findings. Prolabe tissue could not be reduced. Medical treatment was planned. Abdominal ultrasonography was unremarkable. The patient's body mass index was 24. The patient was discharged with estrogen cream, antiinflammatory treatment and sitz bath. At the first month follow-up, the treatment was resumed due to a regression in the findings. Physical examination findings returned to normal at the third month follow-up. The patient is still in the 5th month after treatment and the follow-up is uneventful.

CONCLUSIONS
The etiology of urethral prolapse is not clear. Estrogen deficiency, increased abdominal pressure, obesity and trauma are among the risk factors. As in this patient, the majority of cases presented with suspicion of sexual abuse. Optimal treatment is controversial in patients with urethral prolapse. Medical treatment was successful in the presented case. Conservative treatment may prevent unnecessary invasive procedures.

PW24CR05: POST-TRAUMATIC LIVER PSEUDOANEURYSM MANAGED BY SELECTIVE COIL EMABOLIZATION: A CASE REPORT

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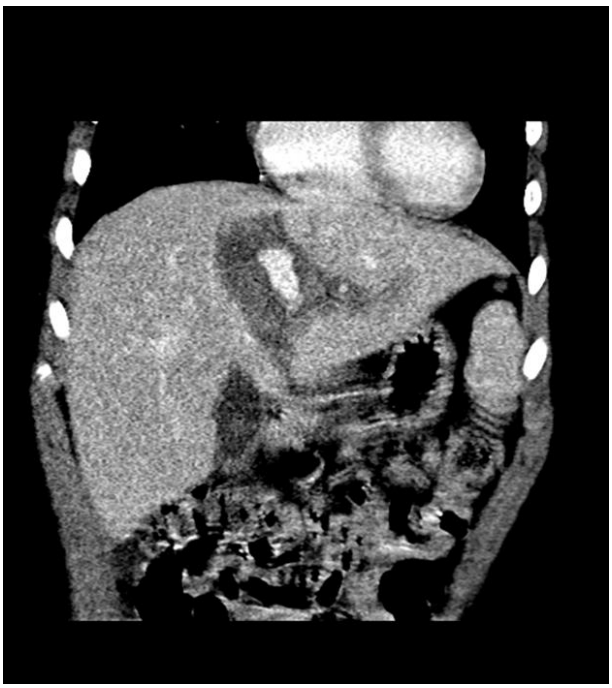
AIM OF THE STUDY
We report our experience with management of post-traumatic liver pseudoaneurysm after abdominal blunt trauma.

CASE DESCRIPTION
An 11-year-old boy with blunt abdominal and thoracic trauma was admitted to the ICU after a high-speed car accident.
Bilateral lung contusions, liver contusion, laceration of the left hepatic lobe and hemoperitoneum were diagnosed in initial computed tomography with the suscpicion of active arterial bleeding from the left hepatic artery. After fluid resuscitation an angiography was performed, but active bleeding from the hepatic artery was not revealed. Conservative management of the trauma was possible due to the patient's stable condition. He underwent routine follow up by Doppler ultrasound screening. 21 days post-injury a pseudoaneurysm of the left hepatic lobe was diagnosed and repeated abdominal CT angio confirmed the presence of a large pseudoanesurysm (diametr 4,5 cm). Angiography, selective catetrization of the 4th segmental hepatic artery and closure of the supplying artery by placement of 4 microcoils was performed. A subsequent digital subtraction angiography (DSA) demonstrated no flow within the pseudoaneurysm. One week after the embolization the boy was discharged home in good condition. Postembolization course was uneventful with a follow-up of 12 months.

CONCLUSIONS
Development of pseudoaneurysm is rare after hepatic injury in children. We suggest a mini-invasive angioembolization as an effective therapy with low risk of complications in a stable patient. Selective embolization decreases the risk of ischemia and prevents life-threatening delayed rupture ofthe pseudoaneurysm.



PW24CR06: AN UNUSUAL LEFT ATRIAL RECURRENCE OF WILMS TUMOR

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BACKGROUND AND AIMS
Majority of relapses in Wilms tumor occur in the lung, tumor bed, or liver and within 2 years. Described here is an unusual recurrencesite that occurred 2.5 years after the primary diagnosis The patient presented with shortness of breath secondary to atrial mass.

CASE

A four-and-a-half year old boy had been previously completely treated for non-metastatic favorable histology right Wilms tumor with chemotherapy, surgery and local flank radiation. Thirty months from initial presentation and nine months after the completion of therapy patient presented to our centre with shortness of breath and features of cardiac failure. On evaluation was found to have left mediastinal mass infiltrating the left pulmonary vein and extending into the left atrium and intermittently obstructing the left atrial outflow. Child underwent an urgent medial sternotomy with excision of left atrial mass and biopsy of the mediastinal mass on cardio-pulmonary bypass. The histopathology confirmed recurrent WT and so he received 6 cycles of ICE (Ifosphamide-Carboplatin-Etoposide) chemotherapy followed by re-excision of the residual mediastinal mass and followed by local post-operative radiation. He remained tumor free for 1 year when follow up CT again showed re-recurrence of left mediastinal mass. The child was started of third line salvage chemotherapy.

CONCLUSION

Mediastinal recurrence with left atrial extension without parenchymal lung involvement has not been described in WT. Alternate salvage chemotherapy with surgical intervention on cardio-pulmonary bypass is effective can be offered.

PW24CR07: SUCCESSFUL CONSERVATIVE TREATMENT WITH PROACTIVE NUTRITION AND ESOPHAGOGASTRIC DECOMPRESSION FOR BUTTON BATTERY INGESTION-INDUCED TRACHEOESOPHAGEAL FISTULA

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AIM OF THE STUDY

Button battery ingestion (BBI) causes a severe complication such as tracheoesophageal fistula (TEF), which requires surgical intervention. We present a case with TEF due to BBI successfully treated by proactive nutrition without surgical intervention.

CASE DESCRIPTION

A 16-month-old boy was referred to our hospital with diagnosis of BBI. High fever and persistent cough with resistant to oral antibiotics, and dysphagia appeared 5 days before the referral. Radiological examinations showed a round-shaped foreign body (FB) impacted at the cervical esophagus accompanied by pneumomediastinum suggesting esophageal perforation. Under general anesthesia and direct visualization with a rigid laryngoscope, the FB, which was confirmed as a lithium button battery, was extracted. We found a severe ulcer but no obvious fistula on the esophagus at that time. Patient was intubated for 5 days maintaining secure airway. A nasogastric tube for decompression and a nasojejunal feeding tube were placed. Enteral feeding was initiated through the nasojejunal tube at 60 kcal/kg/day on the next day after extraction, and increased up to 100 kcal/kg/day. On the day 8 after extraction, endoscopy and fluoroscopy revealed TEF formation, approximately 1cm in diameter. Following continuous antibiotics therapy and proactive nutrition, spontaneous closure of TEF was confirmed on day 28 after extraction. He has been asymptomatic for 2 years after extraction without.

CONCLUSIONS

Proactive nutrition with esophagogastric decompression was effective for healing severe chemical damage due to BBI. Surgical intervention can be evaded by proper proactive nutrition, even if diagnosis of TEF is delayed.

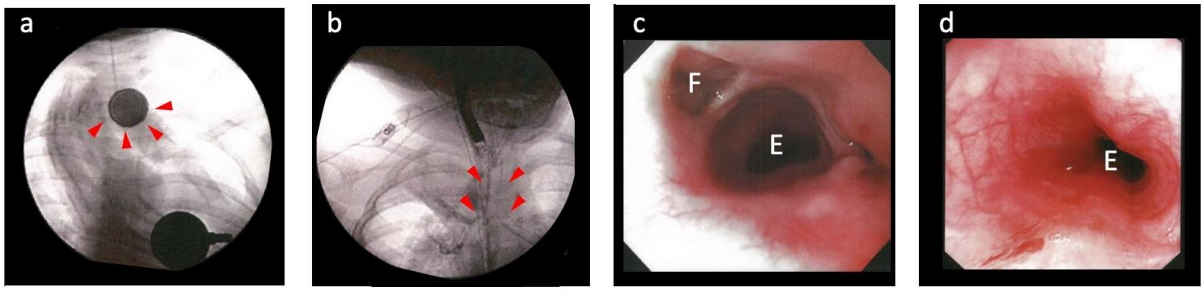

Fig. 1
a: Fluoroscopy at the referral (arrow heads: an impacted round-shaped foreign body)
b: Contrast fluoroscopy on POD 8 (arrow heads: contrast agent flowing into the trachea)
c: Endoscopy on POD 15 (E: esophagus, F: tracheoesophageal fistula)
d: Endoscopy on POD 28 (E: esophagus)
POD: postoperative days

PW24CR08: EPISPADE DUPLICATION OF THE URETHRA REVEALED AFTER A RITUAL CIRCUMCISION

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AIM OF THE STUDY
Urethral duplication is a rare pathology which has varied clinical expression and varied therapies. It mainly interests the boy. The multiplicity of anatomical forms explains the variety of clinical pictures. Here we present a case report of this malformation discovered following a ritual circumcision in a little boy.

CASE DESCRIPTION
We study the clinical, therapeutic and evolutionary characteristics through a case of complete epispade duplication of the urethra which was discovered after a ritual circumcision in a 3 years old boy.
On clinical examination, the penis was straight, the urethral meatus was apical, and the urinary stream was unique. On the dorsal side of the glans there was a medial groove of 4 mm of deep. No radiological exam was done. The diagnosis of partial sagittal duplication of the urethra was retained intraoperatively and we performed an excision of the supernumerary urethra and a plasty of the glans. No post-operative complications were observed.

CONCLUSION
In front of this rare pathology, an accurate anatomical and functional assessment must be realized. Asymptomatic forms are generally respected. The ideal treatment of symptomatic forms is the excision of the urethral duplication

PW24CR09: TWO UNUSUAL INDICATIONS FOR RECTAL PULL-THROUGHS: AT-HOME TRADITIONAL ENEMA DANGER

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AIM OF THE STUDY
Despite serious health risks have been described, herbal enemas are still often used in African traditional medicine. Some of the complications that have been reported include electrolyte derangements, dehydration, and rectal wall injuries. We aim to reported two cases of traditional enemas, to illustrate how severe the injuries can be, and to describe the use of full thickness endoanal pull through, as proposed by Swenson for Hirschsprungs disease, as a surgical option.

CASE DESCRIPTION
The first case was a 2-year-old girl who presented with profuse diarrhoea after a traditional enema administration. At admission she required a laparotomy, colostomy fashioning and extensive debridement of her rectum and perineum. She subsequently had a rectal pull-through, a covering loop ileostomy and an antegrade continence enema (ACE). The ileostomy was reversed at the age of 3 years and she recovered uneventfully post-op.

The second case was a 1 and a half year-old boy who had a hot-water enema administered by an aunt. He was brought into hospital the next day, dehydrated with full-thickness burns to the perineum and rectum. A colostomy was brought out and he later had the colostomy pulled-through. He is now growing well and is fully continent to stools.

CONCLUSIONS
The potential complications associated with the practice of administering at-home enemas can be quite devastating. Full thickness transanal pull through has been proved to be a succesfull technique in patients that suffered rectal burns due to traditional enemas.

PW24CR10: FORMATION OF A TEMPORARY GASTROSTOMY TO AID DELIVERY OF GASTRIC TRICHOBEZOAR AND DECREASE INCIDENCE OF WOUND INFECTION

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[1]Bristol Royal Children Hospital, Bristol, United Kingdom. [2]Tanta University Hospital, Tanta, Egypt. [3]Ain Shams University, Cairo, Egypt

AIM

Report two cases of pediatric gastric trichobezoars in which a modification of the usual technique was used to minimize the risk of wound infection and facilitate trichobezoar removal.

CASE DESCRIPTION

Case 1:

A 10 years old girl presented with history of malaise, weight loss and anemia. On examination, an upper abdominal mass was felt. Abdominal X ray and ultrasound scan showed a heterogeneous mass in the stomach suggestive of a Bezoar that was confirmed on endoscopy. The gastric bezoar was completely removed through a transverse laparotomy with longitudinal gastrotomy in which The cut edges of the stomach were secured to the skin with a circumferential full thickness running suture to form a temporary gastrostomy. The postoperative coarse was uneventful and she was discharged home 7 days after the procedure.

Case2:

A 3 years old girl presented with progressive abdominal distension of 6 months' duration. the family gave a one-year history of pulling her hair and eating it. a left upper quadrant lump was felt on Abdominal examination. Abdominal US showed a gastric intraluminal mass that was diagnosed as trichobezoar on endoscopy. This was followed by laparotomy and removal of the bezoar with the same technique mentioned above. The child was discharged home after 6 days with no postoperative issues.

CONCLUSIONS

The creation of temporary gastrostomy during trichobezoar removal aided easy and complete delivery of the hair balls avoiding any spillage or wound contamination. This modification might help decreasing the high wound infection rates in these cases

PW24CR11: MANAGEMENT OF EPIDERMOID CYST OF THE CECUM IN A PEDIATRIC PATIENT

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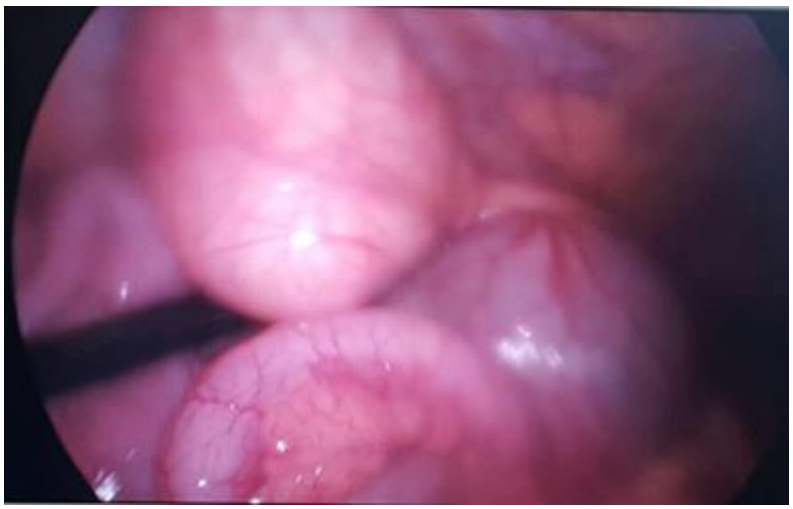
AIM OF STUDY
To describe the management of a patient with abdominal mass and acute abdomen. Literature review of findings

Patient: We describe a 9-year-old boy presenting with 24 hours history of abdominal pain located in right iliac fossa associated to low grade fever and vomiting. Abdominal ultrasound revealed acute appendicitis and a 4 cm retrocecal mass with preoperative diagnosis of intestinal duplication cyst versus theratoma.

RESULTS
The patient underwent laparoscopic appendectomy and exploration of abdominal cavity. Intraoperative findings showed a 4 cm rounded mass adherent to the cecum on its antimesenteric border, with no mural or luminal communication (Figure 1). Complete resection of the mass was achieved with no intraoperative complications and patient was discharged the next day. Follow up period was uneventful. Hystopathologic analysis showed a unilocular cyst with mature keratinizing stratified epithelium containing keratin, diagnosed as epidermoid cyst of the cecum. This entity is extremely rare, with only 11 cases published (one in a pediatric patient). In those cases more invasive diagnostic tests and surgical procedures were performed. Histogenesis remains unknown, with different theories related to an embrionary inclusion of ectodermal elements or the inflammatory chronic reaction to a previous trauma being the most accepted ones.

CONCLUSIONS
Epidermoid cyst of the cecum is a rare entity with unknown origin. It should be kept in mind as differential diagnosis of abdominal masses in order to achieve an appropriate management and avoid aggressive surgical resections. Laparoscopic approach is safe and effective, being useful for both treatment and diagnosis.



PW24CR12: USE OF THE RIVES-STOPPA PROCEDURE FOR A LARGE VENTRAL INCISIONAL HERNIA REPAIR: RECONSTRUCTING THE ABDOMINAL WALL

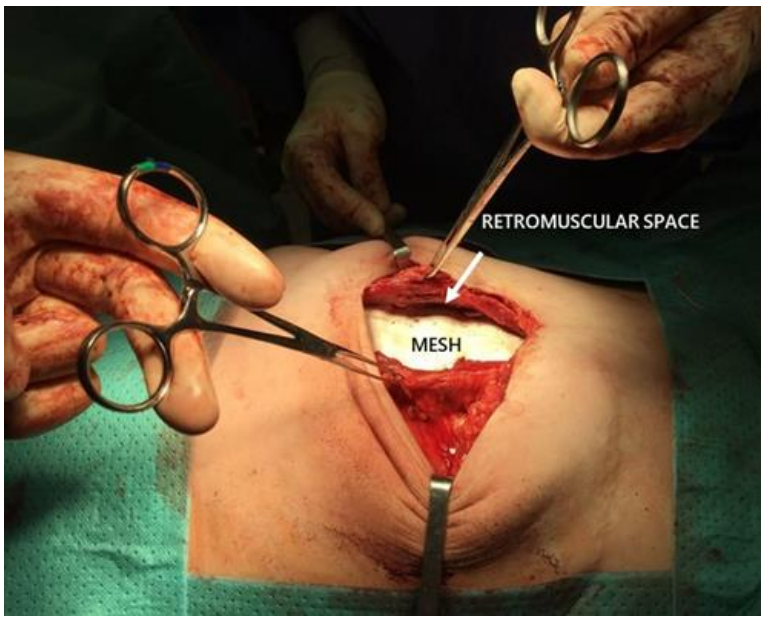
Ada Yessenia Molina Caballero[1], Alberto Pérez Martínez[1], Concepción Goñi Orayen[2]
[1]Department of Pediatric Surgery, Pamplona, Spain. [2]Pediatric Intensive Care Unit. Complejo Hospitalario de Navarra, Pamplona, Spain

AIM OF THE STUDY
The ventral hernia repair with retromuscular mesh placement advocated by Rives and Stoppa, has shown in adults a markedly diminished of reherniation after open treatment of large incisional midline ventral hernias. We present a complex pediatric case successfully treated with this technique.

CASE DESCRIPTION
A 7-year-old male affected by mucopolysaccharidosis and operated on for a small bowel volvulus resulting in infarction, due to an umbilical herniorrhaphy adhesion band, necessitating resection and ostomy. After ostomy closure, he presented a progressive midline eventration. The basic principles of surgical correction were: exploration of the entire wall defect separating the hernial sac from the ileal loops, dissection of the rectomuscular space between the rectus abdominis muscle and its posterior sheath, closure of the peritoneum and the posterior sheath, implantation of a polytetrafluoroethylene mesh in the newly formed retromuscular space and tension-free closure of the rectum and its anterior sheath, thus reconstructing the midline.

After surgery he remained intubated and under muscle relaxation for 10 days. At 24h postoperatively, he presented a subcutaneous hematoma that required surgical exploration and drainage. After 1 year of follow-up, there has been no recurrence of the ventral hernia.

CONCLUSIONS
The Rives-Stoppa procedure achieves a more anatomic multiple layered reconstruction that restores the anatomo-physiologic properties of the abdominal wall; we believe that it can be a useful and versatile alternative in the treatment of large pediatric ventral hernias.



BS01: DYNAMIC PATHOLOGY FOR THE ENTERIC GANGLION CELLS IN MOUSE USING TWO-PHOTON LASER SCANNING MICROSCOPY

Yuhki Koike[1], Keiichi Uchida[1], Kohei Matsushita[1], Mikihiro Inoue[1], Yuji Toiyama[1], Akira Mizoguchi[2], Masato Kusunoki[1]
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[2]Department of Neural Regeneration and Cell Communication, Mie University Graduate School of Medicine, Tsu, Japan

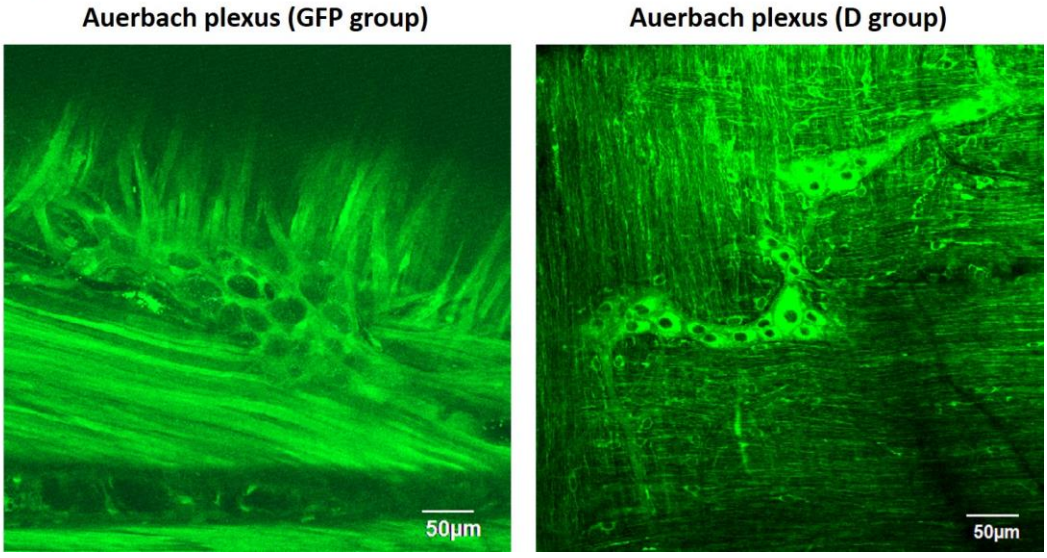
AIM OF STUDY
Previously, we have developed the observation methods of the live intestine using two-photon laser scanning microscopy (TPLSM). In this study, using the live imaging technique, we investigated the feasibility of the intravital observation for the intestinal ganglion cells (IGCs).

METHODS
Following ethical approval (n.24-40), intravital total intestinal wall scan from serosal to mucosal layer was performed by TPLSM in both green fluorescent protein (GFP) mouse (n=4; GFP group) and C57BL6 mouse (n=4; D group). Visualizing the IGCs in no fluorescent mouse, drug X (natural edible fluorescent) was sprayed on the intestinal wall (PCT:JP2018/43636). The number of Auerbach/Meissner plexus per 3D scan was counted in both group. Data was compared using Mann-Whitney test.

MAIN RESULTS
Visualization of the intravital Auerbach/Meissner plexus without opening the intestinal wall was performed successfully in both group (Figure). Detection rate of Auerbach plexus was 81% in GFP group, and 94% in D group. Detection rate of Meissner plexus was 94% in both group. Mean number of enteric ganglion cells per 3D scan were 1.06±0.68 vs. 1.75±0.93 (GFP groups vs. D group, p=0.036) in Auerbach plexus, and 1.06±0.44 vs. 1.56±0.89 (GFP groups vs. D group, p=0.074) in Meissner plexus.

CONCLUSIONS
This observation technique made it possible to assess the dynamic pathological analysis of IGCs in live animal. This study proves the concept that the IGCs observation technique we introduced could be beneficial during the operation of Hirschsprung disease as the substitute for the operative rapid pathologic diagnosis.

Figure



BS02: TREATMENT OF NECROTIZING ENTEROCOLITIS BY CONDITIONED MEDIUM DERIVED FROM HUMAN AMNIOTIC FLUID STEM CELLS

Joshua S. O'Connell[1], Bo Li[1], Marissa Cadete[1], Nassim Farhat[1], Carol Lee[1], Ketan Patel[2], Steve Ray[3], Robert Mitchell[2], Paolo De Coppi[3,4], Agostino Pierro[1]
[1]The Hospital for Sick Children, Toronto, Canada. [2]University of Reading, Reading, United Kingdom. [3]Micregen, Biohub, Cheshire, United Kingdom. [4]UCL Great Ormond STreet Institute of Child Health, London, United Kingdom

AIM OF THE STUDY

Necrotizing enterocolitis (NEC) is a devastating gastrointestinal emergency affecting preterm neonates. Amniotic fluid stem cells (AFSCs) improve intestinal injury related to experimental NEC but are difficult to administer. We evaluated whether conditioned medium (CM) derived from *human* AFSCs have similar effects.

METHODS

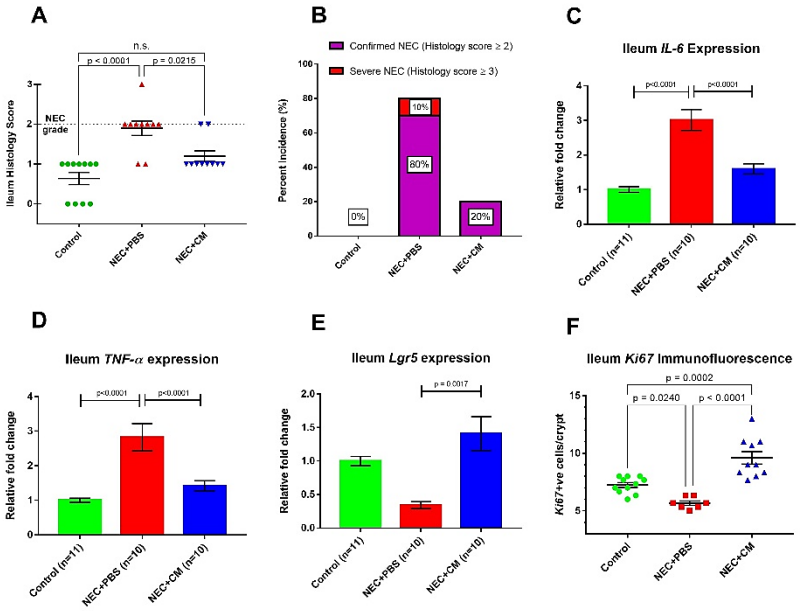
C57BL/6 mice were divided into: 1) control (breast fed; n=11); 2) experimental NEC with phosphate buffered saline (PBS) administration (NEC+PBS; n=10); and 3) experimental NEC with CM administration (NEC+CM; n=10). Experimental NEC was induced from post-natal days (P) 5-9 via; (a) gavage feeding of hyperosmolar formula four times daily, (b) hypoxia for 10 minutes prior to all feeds, and (c) lipopolysaccharide. Intraperitoneal injections of PBS or CM were given on P6 and P7. Ileum was harvested on P9. Data were analyzed by ANOVA with mean ± SEM.

MAIN RESULTS

Histological scores revealed significant increases in severity and NEC incidence for NEC+PBS pups; NEC+CM were similar to control (Fig. 1A-B). There were significant rises in *IL-6* and *TNF-α* expressions (RT-PCR) for NEC+PBS pups; NEC+CM were similar to control (Fig. 1C-D). CM administration showed significant rises in intestinal stem cell (*Lgr5* expression by RT-PCR; Fig. 1E) and proliferation (*Ki67* expression by immunofluorescence; Fig. 1F) markers indicating recovery from injury.

CONCLUSIONS

Administration of CM derived from *human* AFSCs in experimental NEC is associated with various benefits. Reduced intestinal injury and inflammation, with increased stem cell expression and enterocyte proliferation. This provides first evidence of the usefulness of human AFSC products in NEC.



BS03: DECREASED EXPRESSION OF β1 INTEGRIN IN THE ENTERIC NEURAL CREST CELLS IN THE ENDOTHELIN RECEPTOR B NULL MOUSE MODEL

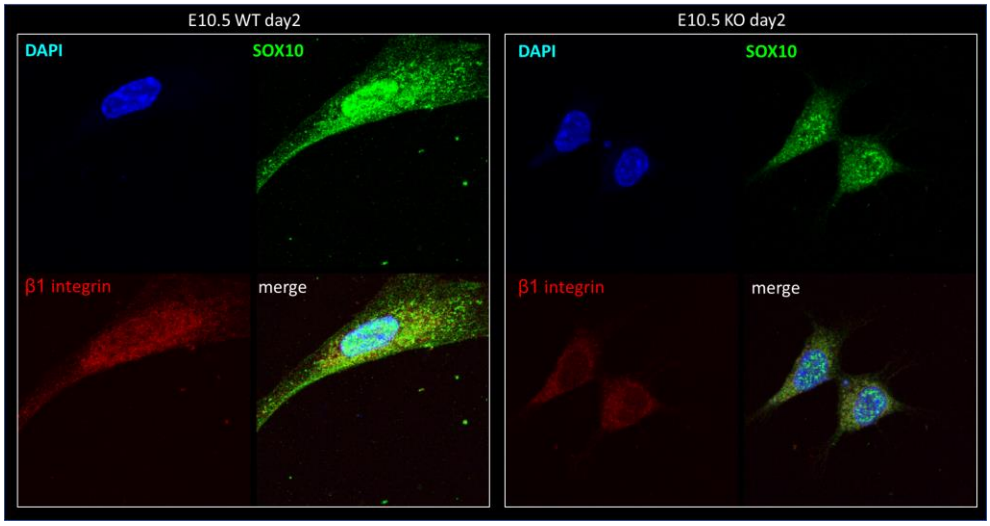
Nana Nakazawa-Tanaka[1], Katsumi Miyahara[2], Naho Fujiwara[2], Chihiro Akazawa[3], Masahiko Urao[1], Atsuyuki Yamataka[2]
[1]Department of Pediatric Surgery, Juntendo University Nerima Hospital, Tokyo, Japan. [2]Department of Pediatric Surgery, Juntendo University School of Medicine, Tokyo, Japan. [3]Department of Biochemistry and Biophysics, Graduate School of Health Care Science, Tokyo Medical and Dental University, Tokyo, Japan

AIM OF THE STUDY
Interactions between enteric neural crest-derived cells (ENCC) and the surrounding intestinal microenvironment, such as extracellular matrix (ECM) are required for normal enteric nervous system (ENS) development. We have recently demonstrated that expression of laminin-1, one of the major ECM molecules, was increased in the gut of endothelin receptor B knock out (*Ednrb* KO) Hirschsprung disease (HD) mouse model. We hypothesized that excessive laminin is caused by insufficiency of the receptors, that impairs interaction between ENCC and laminin, resulting in aganglionosis. To test the hypothesis, we examined the expression of β1 integrin, which is a receptor for laminin, in ENCC in *Sox10*-VENUS positive *Ednrb* KO HD mouse model.

METHODS
Sox10 transgenic mice whose ENCC can be visualized with enhanced green fluorescent protein, VENUS and *Ednrb* KO mice were crossed to develop *Sox10*-VENUS positive *Ednrb* KO mouse. *Sox10*-VENUS positive *Ednrb* wild type (WT) was used as control. The fetal guts were dissected on embryonic day 10.5 (E10.5). Cells were isolated and cultured. VENUS positive ENCCs were immunostained with β1 integrin on day2 and day7. The images were taken by a laser scanning microscopy.

MAIN RESULTS
The expression of β1 integrin in the ENCC was decreased after a 2 day culture of E10.5 KO mouse compared to WT (Fig). On day 7, β1 integrin expressions were both decreased in KO and WT compared to day2.

CONCLUSIONS
Taken together with our previous results, impairment of interaction between laminin and integrin in ENCC may disturb normal ENS development during the crucial period, resulting in aganglionic colon in HD.



BS04: INTESTINAL ORGANOIDS AND NECROTIZING ENTEROCOLITIS

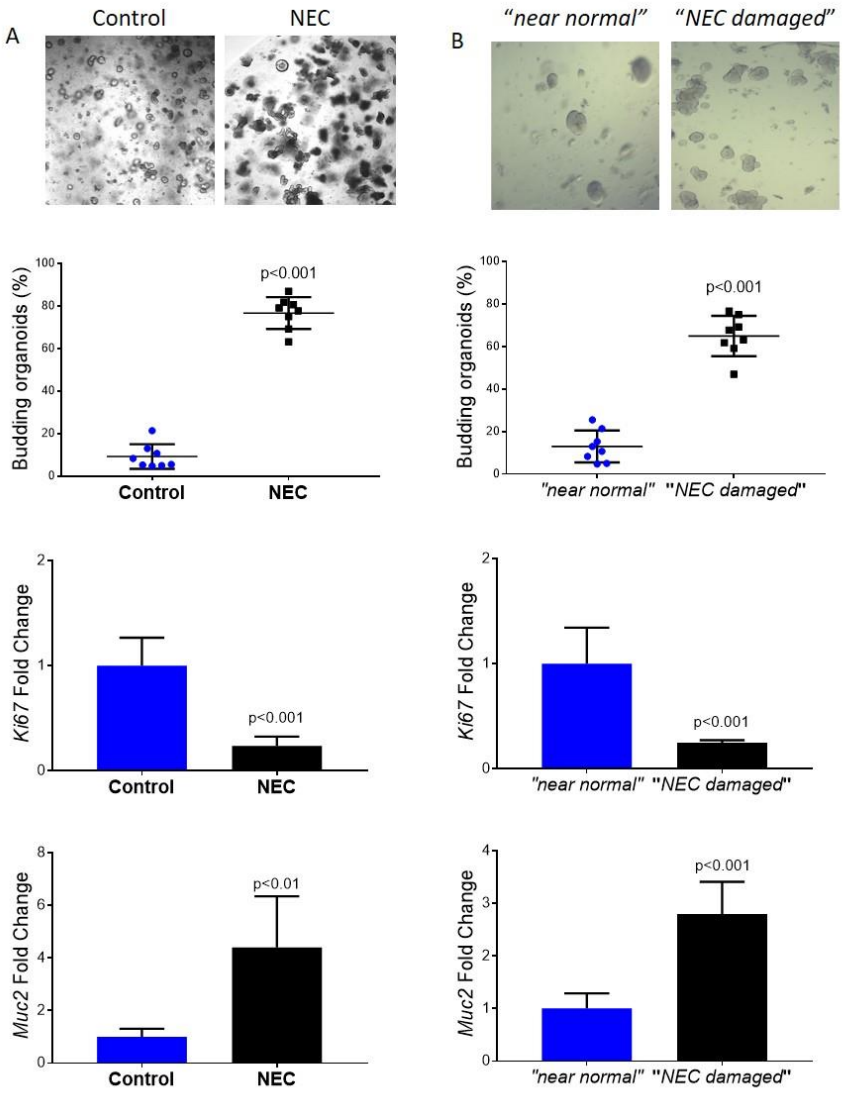
Bo Li, Carol Lee, Marissa Cadete, Agostino Pierro
The Hospital for Sick Children, Toronto, Canada

AIM OF THE STUDY
Intestinal organoids contain all cell types of intestinal epithelium, are useful to study the pathophysiology of intestinal diseases such as necrotizing enterocolitis (NEC). We aimed (i) to develop intestinal organoids from both animals and humans with NEC and (ii) to contribute to the understanding of NEC development.

METHODS
Mice: Experimental NEC was induced by gavage feeding of hyperosmolar formula, hypoxia and lipopolysaccharide administration during postnatal days 5-9 (AUP #32238). At P9, intestinal crypts were isolated from the ileum of breastfed controls and NEC mice to grow organoids.
Humans: Ileal samples were obtained from neonates with NEC undergoing intestinal resection (REB #1000056881). Ileum close to the edge of intestinal resection in the "*near normal*" area and close to the necrosis/perforation in the most "*NEC damaged*" area was derived to grow organoids.

MAIN RESULTS
Mice: NEC-derived organoids compared to those derived from controls had more budding indicating differentiation. There was less expression of proliferation maker (Ki67) and higher expression of differentiation marker (Muc2) in NEC organoids compared to control organoids (Figure A).
Humans: Similar to mice, the intestinal organoids from "*NEC damaged*" compared to "*near normal*" tissue grew larger, had more budding, less proliferation marker (Ki67) and higher differentiation marker (Muc2) (Figure B).

CONCLUSIONS
Intestinal organoids can be developed from NEC damaged intestine of both mice and humans. Organoids derived from NEC damaged intestine have abnormally low proliferation and high differentiation. To promote intestinal recovery in NEC, the balance between proliferation and differentiation should be reversed.


A
Control
NEC
B
"near normal"
"NEC damaged"
Budding organoids (%)
p<0.001
Control
NEC
"near normal"
"NEC damaged"
Ki67 Fold Change
p<0.001
Muc2 Fold Change
p<0.01
p<0.001

BS05: MITOCHONDRIAL DNA: A BIOMARKER OF DISEASE SEVERITY IN NECROTIZING ENTEROCOLITIS

Edoardo Bindi, Bo Li, Maarten Janssen Lok, Haitao Zhu, Shogo Seo, Agostino Pierro
Department of General and Thoracic Surgery. The Hospital of SIck Kids., Toronto, Canada

AIM OF THE STUDY

There is a need to develop sensitive markers to diagnose or monitor the severity of intestinal damage in necrotizing enterocolitis (NEC). Mitochondrial DNA (mtDNA) is increased in the intestine and blood of adults in response to intestinal ischemia and can trigger secondary organ damage. We hypothesize that mtDNA is increased during experimental NEC and that mtDNA levels are correlated to the degree of intestinal injury.

METHODS

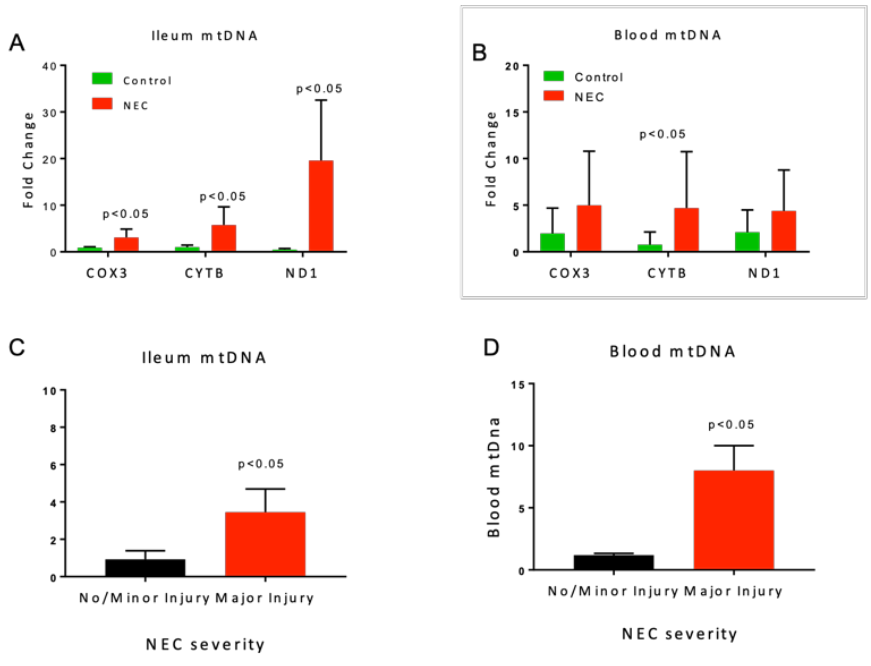
NEC was induced in C57BL/6 mice (n=5) (approval: 44032) by gavage feeding with hyperosmolar formula, hypoxia, and lipopolysaccharide administration from postnatal day p5-9. Breastfed pups served as control (n=5). Blood was collected by cardiac puncture and terminal ileum was harvested on p9. RT-qPCR was used to measure mtDNA (markers COX3, CYTB, ND1) and inflammatory cytokines (IL-6 and TNFα) in blood and ileum. The intestinal injury was scored blindly by 3 investigators and classified as no/minor injury (score 1) or NEC (score ≥2).

MAIN RESULTS

mtDNA is significantly increased in gut and blood of NEC mice (Figure A, B). Furthermore, mtDNA increases in intestine and blood proportionally to the degree of intestinal injury as indicated by histological scoring (Figure C, D) and increased expression of IL6 ($r=0.95$; $p<0.05$) and TNFα ($r=0.86$; $p<0.05$).

CONCLUSIONS

Following NEC intestinal injury, mtDNA is released from the intestine into circulation. The blood level of mtDNA is related to the degree of intestinal injury. mtDNA can be developed as a novel marker of intestinal injury and can be useful to monitor NEC progression.



BS06: LACTOFERRIN REDUCES NECROTIZING ENTEROCOLITIS SEVERITY BY UPREGULATING INTESTINAL EPITHELIAL PROLIFERATION

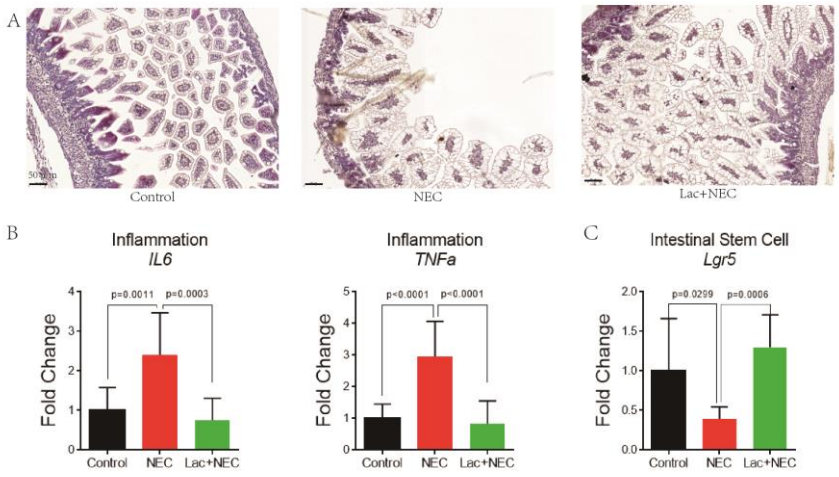
Jia Liu[1,2], Haitao Zhu[1,2], Bo Li[1], Shaiya Robinson[1], Carol Lee[1], Joshua OConnell[1], Edoardo Bindi[1], Shan Zheng[2], Agostino Pierro[1]
[1]The Hospital for Sick Children, Toronto, Canada. [2]Children's Hospital of Fudan University, Shanghai, China

AIM OF THE STUDY
Lactoferrin is the dominant whey protein in human milk and has important immunomodulatory functions. Previous studies have indicated protective effects of lactoferrin against neonatal sepsis and necrotizing enterocolitis (NEC).However, the underlying mechanism of protection of lactoferrin in NEC remains unclear. We hypothesize that lactoferrin downregulates inflammation and upregulates proliferation in the intestinal epithelium during NEC injury.

METHODS
NEC was induced by hypoxia, and gavage feeding of hyperosmolar formula and lipopolysaccharide between postnatal day P5 and P9 (n=8). Breastfed mice were used as control (n=7). Lactoferrin (0.3g/kg/day) was administered once daily by gavage from P6 to P8 in both NEC (Lac+NEC, n=9) and control mice (n=5). Distal ileum was harvested on P9 and analyzed for disease severity, inflammation and proliferation. Groups were compared using one-way ANOVA and t-test as appropriate; $p<0.05$ was considered significant.

MAIN RESULTS
Compared to NEC group, lactoferrin-treated NEC mice had reduced disease severity (Figure-A), reduced intestinal inflammation (reduced expression of *IL-6* and *TNF-α*, Figure-B), and increased expression of the intestinal stem cell marker, *Lgr5* (Figure-C). In lactoferrin-treated mice β-catenin was increased indicating upregulation of Wnt pathway and Ki67 expression was increased indicating promotion of proliferation. Furthermore, lactoferrin administration to normal mice did not cause inflammatory changes but activated *Lgr5+* stem cells and epithelial proliferation.

CONCLUSION
Lactoferrin administration reduces the intestinal injury in experimental NEC by downregulating inflammation and upregulating cell proliferation. This beneficial effect of lactoferrin in stimulating cell proliferation is mediated by the Wnt pathway.



BS07: OPTIMIZATION OF A MURINE MODEL OF NECROTIZING ENTEROCOLITIS BY NORMALIZATION OF NEUTROPHIL LEVEL

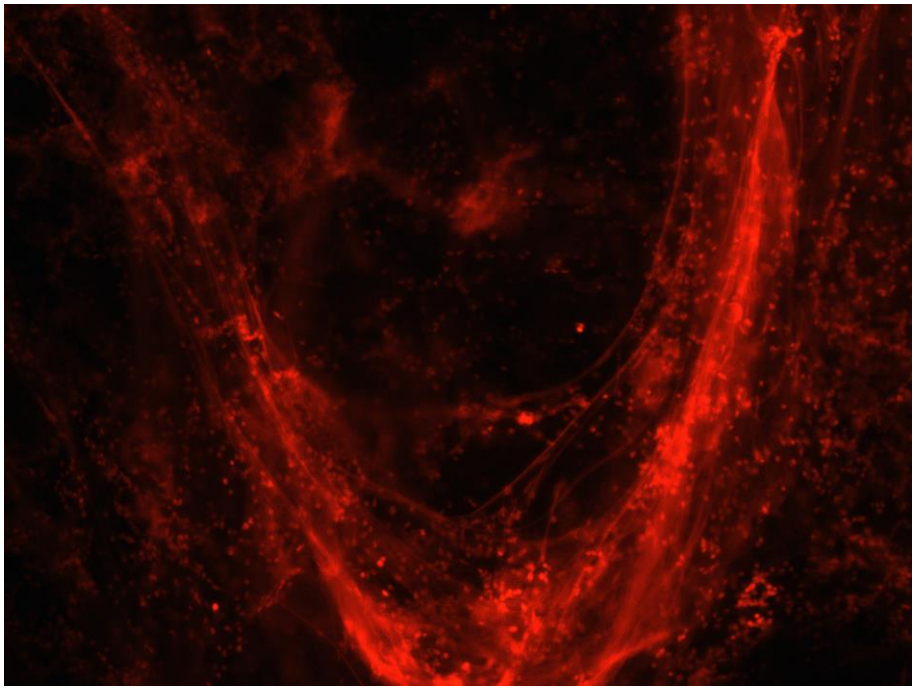
Michaela Klinke, Deirdre Vincent, Laia Pagerols Raluy, Konrad Reinshagen, Michael Boettcher
UKE Medical School , Hamburg, Germany

INTRODUCTION
Various factors have been demonstrated to induce necrotizing enterocolitis (NEC) in mice. Although several models are currently used in order to mimic human pathology, differences in NEC severity between mice and humans nevertheless exist, most likely due to differences in human and mouse neutrophil concentration (humans 50%-70% vs. mice 10%-25%). Thus, adapting neutrophils may improve current NEC models; which was aim of the study.

METHODS
In total, 52 C57BL6 mice were used. Mice underwent an established NEC induction paradigm, using gavage feeding of Neocate plus LPS, followed by 10min hypoxia. Out of the 52 NEC mice, 1/3 were used as controls, whereas the remaining 2/3 received granulocyte colony stimulating factor 1x daily. The GCSF group was further divided into two subgroups: (1) wildtype, and (2) ELANE-knockout (control of potential secondary effects of GCSF administration).

Results
GCSF administration resulted in significantly higher neutrophil levels, vastly elevated NEC manifestation (88% vs. 20%, p=0.018) with consecutive tissue damage (Caplan score), and intestinal inflammation (DNA, NE, MPO and H3cit) without affecting mortality. Animals that were unable to build neutrophils appeared to be protected from NEC.

DISCUSSION
We established a new and more accurate NEC model with high NEC manifestation rates through the use of (1) LPS and Neocate gavage feeding, (2) hypoxia, and (3) GCSF administration. Additionally, no maternal separation or hypothermia was necessary, making the model more ethical and animal friendly



BS08: REGENERATIVE POTENTIAL OF EMBRYONIC INTESTINAL ORGANOIDS

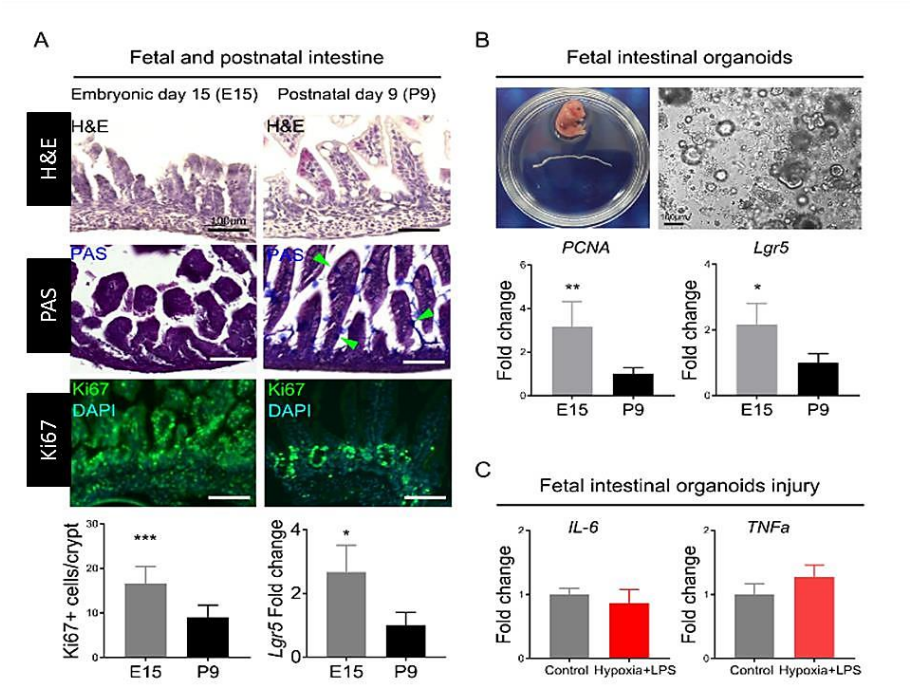
Carol Lee, Bo Li, Haitao Zhu, Jia Liu, Agostino Pierro
Hospital for Sick Children, Toronto, Canada

AIM OF THE STUDY
Intestinal regeneration is essential to counteract the deleterious consequences of diseases such as midgut volvulus and necrotizing enterocolitis. Intestinal organoids contain intestinal stem cells (ISC) and can promote regeneration. As the embryonic intestine undergoes rapid growth, we aimed to evaluate the regenerative characteristics of embryonic intestine and derived intestinal organoids.

METHODS
In vivo: Following ethical approval (#44032), ileum was harvested from mice on embryonic day 15 (E15) and postnatal day 9 (P9). Intestine morphology (H&E staining), differentiation marker for goblet cell (PAS), epithelial proliferation (Ki67) and ISC marker Lgr5 were analyzed.
Ex vivo: Crypts isolated from intestinal tissue and organoids were cultured. Organoids were assessed for epithelial proliferation (PCNA) and ISC Lgr5. Organoids were exposed to stress factors such as hypoxia and lipopolysaccharide (LPS) and inflammatory cytokines IL-6 and TNFα were evaluated. Data were compared by student T-test.

MAIN RESULTS
In vivo: Compared to P9, intestinal epithelium at E15 is immature and has no differentiated goblet cells, however, it has higher expression of proliferation marker Ki67 and ISC marker Lgr5 (Figure A).
Ex vivo: Organoids derived from E15 have higher expression of PCNA and Lgr5 (Figure B). Unlike P9 organoids, hypoxia and LPS administration did not induce inflammation (IL6 and TNFα) in embryonic intestinal organoids (Figure C).

CONCLUSIONS
Embryonic intestinal tissues and organoids have high expression of intestinal stem cells and epithelial proliferation. These embryonic organoids have strong potentials for intestinal recovery as they promote intestinal development and regeneration and are resistant to injury.


A
Fetal and postnatal intestine
Embryonic day 15 (E15)
Postnatal day 9 (P9)
H&E
PAS
Ki67
DAPI
Ki67+ cells/crypt
***
E15
P9
Lgr5 Fold change
*
B
Fetal intestinal organoids
PCNA
Lgr5
Fold change
**
*
C
Fetal intestinal organoids injury
IL-6
TNFa
Control
Hypoxia+LPS

BS09: LIVER ORGANOIDS GENERATED FROM MICE WITH NECROTIZING ENTEROCOLITIS HAVE REDUCED REGENERATIVE CAPACITY

Hiromu Miyake[1,2], Carol Lee[1], Shogo Seo[1], Bo Li[1], Agostino Pierro[1]
[1]The Hospital for Sick Children, Toronto, Canada. [2]Shizuoka Children's Hospital, Shizuoka, Japan

AIM OF THE STUDY

Necrotizing enterocolitis (NEC) is one of the most severe gastrointestinal disease in infancy. NEC can cause metabolic derangements, multi-organ injury including severe liver damage. The mechanism leading to hepatic damage in NEC remains unclear. The aim of this study is to establish and characterize liver organoids from NEC mice.

METHODS

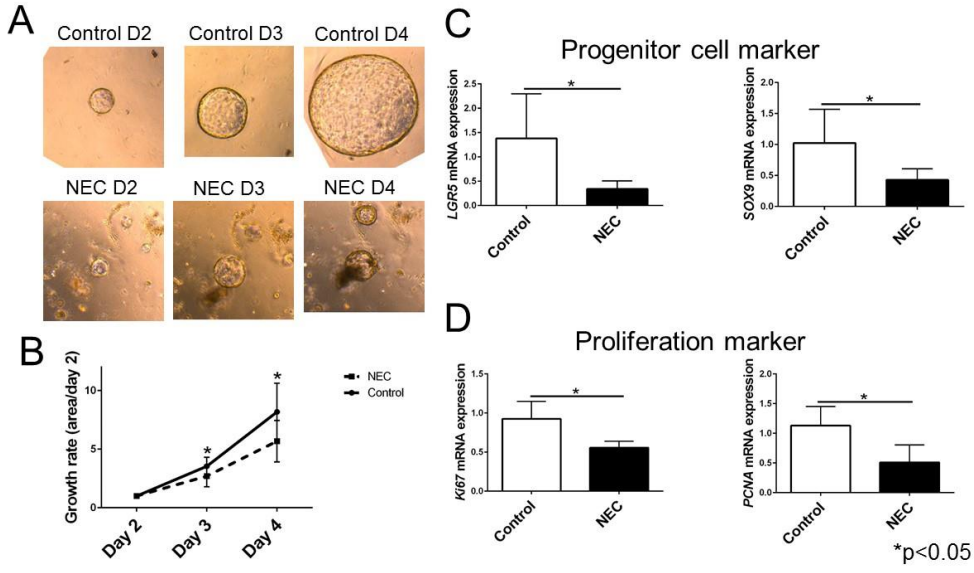
Following ethical approval (#44032), we induced experimental NEC from postnatal day 5 (P5) to P9 using C57BL/6 mice pups. NEC was induced by gavage formula feeding, gavage LPS administration and hypoxia. Breastfed pups were used as control. On P9, NEC and control pups were sacrificed and liver tissue was harvested and organoids were generated. Organoid size was recorded daily (day 2 to 4) by measuring their surface area and organoid growth was calculated. RNA was extracted on day 4 after liver organoid generation.

MAIN RESULTS

Organoid growth rate was significantly lower in NEC liver organoids compared to control liver organoids [Figure A,B]. mRNA expression of liver progenitor cells markers of LGR5 and SOX9 was lower in NEC liver organoids compared to control liver organoids [Figure C]. Similarly, expression of proliferation markers of Ki67 and PCNA was lower in NEC liver organoids [Figure D].

CONCLUSIONS

We report a novel technique to generate liver organoids during NEC. Liver organoids derived from NEC mice are characterized by reduced progenitor cells, reduced proliferation and overall impaired regenerative capacity. Liver progenitor cells are important targets to prevent liver damage in NEC and promote recovery.



BS10: MARKERS OF NETOSIS ARE PREDICTIVE OF APPENDICITIS: A PILOT STUDY

Michael Boettcher, Stefam Klohs, Nariman Mokhaberi, Anna-Lisa Schacker, Laia Pagerols Raluy, Konrad Reinshagen, Michaela Kllinke
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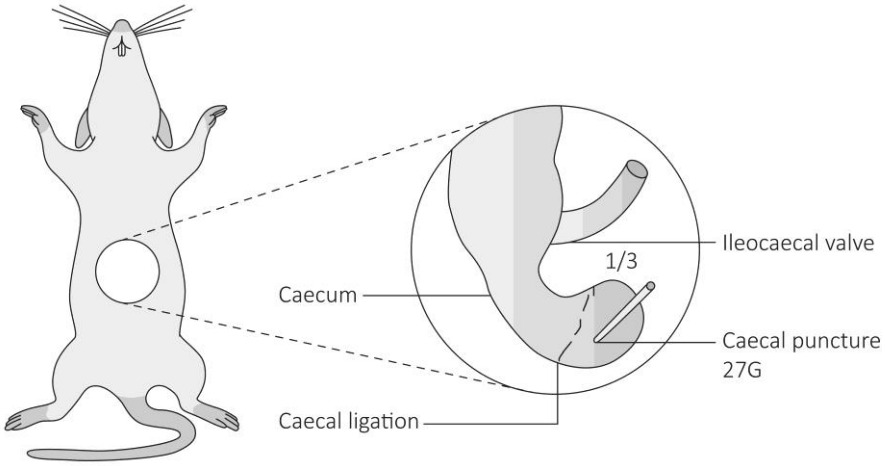

INTRODUCTION
Appendicitis is one of the most frequent emergencies in pediatric surgery. Current biomarkers for diagnosis are unspecific and have low predictive values. Neutrophiles and neutrophil extracellular traps (NETS) are an essential component of the immune defense against bacterial infections. The aim of this pilot study was to establish a murine model of appendicitis and to evaluate NETs markers to diagnose appendicitis in mice and humans.

METHODS
For the study 6-weeks old C57BL/6 mice were used and advanced appendicitis was induced using a modified CLP (caecal ligation puncture) procedure. In control animals, only a laparotomy was performed. In all animals, blood work, CRP, cell-free DNA (cfDNA), neutrophil elastase (NE), myeloperoxidase (MPO) and citrullinated Histone H3 (H3cit) was assessed very 24 hours. Additionally, in 5 children with histology confirmed appendicitis and in 5 matched controls without appendicitis the same markers were evaluated. Moreover, DAPI, NE, MPO and H3cit were evaluated histologically in mice and humans.

RESULTS
In total 20 mice (12 appendicitis- and 8 control group) were utilized. All animals survived the procedure until day 5. All mice developed an advanced form appendicitis with focal peritonitis. In mice and humans blood markers of NETs formation correlated significantly with appendicitis. Moreover, mice and humans had similar histopathological findings.

CONCLUSION
The modified CLP procedure is an excellent model for advanced appendicitis. Histopathology confirmed similar findings in the mice and in humans with confirmed appendicitis. NETs markers appear to be an excellent biomarker of appendicitis and should be validated in large prospective clinical study.

BS11: CALCIUM/CALMODULIN-DEPENDENT PROTEIN KINASE IV (CAMKIV) AND NECROTIZING ENTEROCOLITIS

Mashriq Alganabi[1], Haitao Zhu[1], Maarten Janssen Lok[1], Joshua S. O'Connell[1], Edoardo Bindi[1], Bo Li[1], George Biouss[1,2], Agostino Pierro[1,2]
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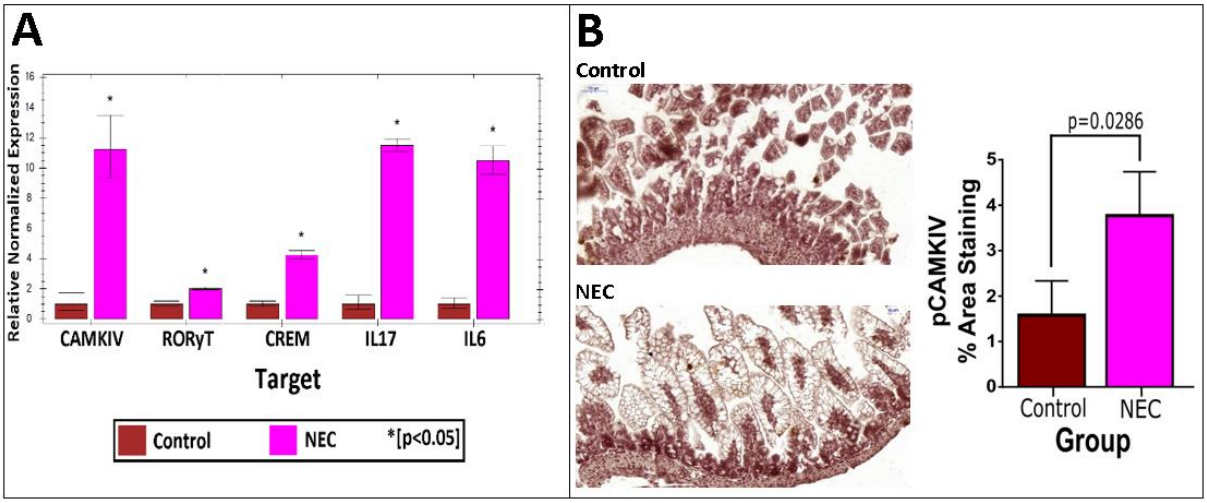
AIM OF STUDY
Calcium/Calmodulin-dependent protein kinase IV (CAMKIV) has been studied in several autoimmune and intestinal diseases. CAMKIV activation has been shown to increase intestinal injury and inhibit epithelial cell proliferation in DSS-colitis in mice. However, the role of CAMKIV in necrotizing enterocolitis (NEC) is unknown. We aim to study the expression and activation of CAMKIV in experimental NEC.

METHODS
Following ethical approval, NEC (n=5) was induced in C57BL/6 mouse pups by hypoxia, gavage hyperosmolar formula feeding and lipopolysaccharide from postnatal days P5-9. Breastfed pups served as control (n=5). Mouse pups were sacrificed on P9 and the ileum was harvested. NEC injury was scored blindly by 3 independent investigators. CAMKIV gene and protein expression were assessed and the data compared using Mann-Whitney U test. P<0.05 was considered significant.

MAIN RESULTS
Intestinal injury was induced in the NEC mice (p<0.05). *CAMKIV* and its downstream target genes of *RoRγT, CREM,* and *IL17* were all significantly elevated in NEC mice relative to control (Figure A). Similarly, phosphorylated-CAMKIV (pCAMKIV), the active form of CAMKIV, was more notably expressed in the NEC group relative to control (Figure B).

CONCLUSIONS
CAMKIV expression and activation are upregulated in experimental NEC suggesting a potential contributing factor in the pathogenesis of NEC. Further investigations are planned to elucidate the mechanism of CAMKIV activation in NEC.

Figure



BS12: PROTEOMIC PROFILING IN EXPERIMENTAL CONGENITAL DIAPHRAGMATIC HERNIA SHOWS STRONG IMMUNE REACTION WITHIN HYPOPLASTIC LUNGS

Richard Wagner[1,2], Hadeesha Piyadasa[1], Christopher D. Pascoe[1], Daywin Patel [1], Martin Lacher[2], Neeloffer Mookherjee[1], Richard Keijzer[1]
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AIM OF THE STUDY
Although several individual proteins have been studied in Congenital Diaphragmatic Hernia (CDH) its complex pathobiology remains poorly understood. We therefore aimed to determine the entire proteomic dysregulations in nitrofen-induced hypoplastic CDH lungs to identify altered pathways within this condition.

METHODS
After ethical approval we used the nitrofen rat model for CDH and harvested fetal CDH (n=5) and control (n=5) lungs that were flash frozen before protein isolation. After sample preparation, label-free 1-D liquid chromatography coupled with mass spectrometry (LC-MS/MS) was used to obtain the proteomic profiles of CDH and control lungs. Bioinformatic analysis was performed using R Software. Pathway analysis and protein interaction networks were created with ingenuity pathway analysis (IPA) and networkanalyst.ca. Main results: The proteomic profile of hypoplastic CDH lungs showed a strong immunological signature with significant upregulation of immune response proteins. In total 218 proteins were significantly ($p< 0.05$) dysregulated in CDH lungs (94 up-regulated; 124 down-regulated). Cluster analysis (PLS-DA) separated our data set clearly into two independent groups (CDH vs. Control). VIP-score analysis revealed the most important proteins driving the dysregulations in CDH. Among the most connected and dysregulated proteins were Stat3, Crebbp, Nfkb1 and Tenascin C. Using interactome network analysis we identified interleukin signalling, cytokine signalling and innate immune response as the most enriched biological processes.

CONCLUSIONS
Hypoplastic CDH lungs show a significantly increased immune response associated with changes in the proteomic profile of the lung. Using this approach, we identified several novel proteins involved in the pathogenesis of CDH.

BS13: ENDOPLASMIC RETICULUM STRESS IS ASSOCIATED WITH REGULATION OF INTESTINAL PERMEABILITY IN NECROTIZING ENTEROCOLITIS

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AIM OF THE STUDY

Necrotizing enterocolitis (NEC) is associated with disruption of intestinal epithelial integrity. Amniotic fluid stem cells (AFSC) improve intestinal permeability in experimental NEC, but the mechanism remains unclear. Endoplasmic reticulum (ER) stress response is vital to maintain intestinal integrity and barrier function to reestablish homeostasis. We hypothesize that AFSC restore intestinal permeability via regulation of ER stress pathways.

METHODS

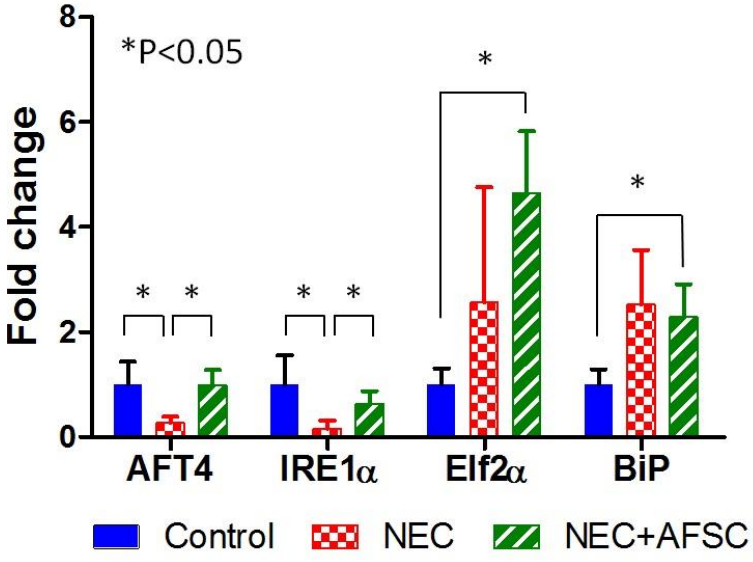
Following ethical approval (license no. 44032), NEC was induced in 5-day old C57Bl/6 mouse pups for 4 days using hypoxia, lipopolysaccharide (4mg/kg) and gavage feeding of hyperosmolar formula. AFSC ($2X10^6$, n=8) or PBS (n=8) were administered intraperitoneal on postnatal day 6 and 7. Breastfed (control) pups served as controls (n=6). Terminal ileum was harvested at postnatal day 9 and studied for ER stress markers using RT-qPCR.

MAIN RESULTS

NEC was associated with disruption of ER lumen-located sensor molecules, ATF4, IRE1α, Elf2α and BiP. Administration of AFSC in NEC rescued the expression of PERK sensor via its downstream molecules ATF4 and IRE1α (Figure), without exerting effects on Elf2α and BiP.

CONCLUSIONS

Necrotizing enterocolitis is associated with disrupted endoplasmic reticulum stress sensors. These alterations can be reversed by administration of amniotic fluid stem cells, through their effect on the PERK pathway. This study provides insight into pathogenesis of NEC and highlights the potential therapeutic targets for the treatment of NEC.



BS14: IDENTIFICATION OF A SOX2 INTERACTION PARTNER AS A PUTATIVE PLAYER IN CONGENITAL LUNG DISORDERS

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[1]Erasmus MC-Sophia Children's Hospital, Rotterdam, Netherlands. [2]Center for Proteomics-Erasmus MC, Rotterdam, Netherlands

AIM
Epithelial dysfunction due to aberrant differentiation of the embryonic epithelium is frequently involved in congenital lung disorders. The transcription factor SOX2 is central in a network of factors driving differentiation and maturation of the immature epithelium. Aberrant expression of SOX2 has been observed in congenital pulmonary airway malformations lung tissue. We developed a system to purify SOX2 binding proteins *in vivo* to delineate the role of SOX2 in the airways. We identified Cut-like homeobox-1 (CUX1) as a putative partner and interestingly, CUX1 depleted mice suffer from respiratory distress. Our aim is to identify the putative role of SOX2-CUX1 interaction in epithelial differentiation and in congenital lung disorders.

METHODS
SOX2 complexes were isolated from embryonic mouse lungs and SOX2 associating proteins were identified by mass spectrometry. Protein interactions were validated *in vitro* by transfection of SOX2 and CUX1 protein expression plasmids followed by a pull-down of the protein complex and identification of both proteins. Co-localization of SOX2 and CUX1 were studied using immunofluorescence staining of mouse and human lung tissue.

MAIN RESULTS
We demonstrate that CUX1 co-localizes with SOX2 in epithelial cells of the developing lung. Furthermore, we show that the C-terminal part of CUX1 associates with the N-terminal part of SOX2.

CONCLUSION
We developed an *in vivo* system to identify SOX2 protein complexes and show that CUX1 physically interacts with SOX2 and identified their respective binding domains. Future research is aimed at identifying the functional relationship between CUX1 and SOX2 and its putative role in congenital lung disorders.

BS15: PATHOGENETIC VALUES OF FECAL CALPROTECTIN, MATRIX METALLOPROTEINASES AND TISSUE INHIBITORS IN PATHOGENESIS OF NECROTIZING ENTEROCOLITIS IN NEWBORN

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AIM OF THE STUDY
To investigate the role of matrix metalloproteinases (MMP-2 and MMP-9), fecal calprotectin (FC), tissue inhibitors of metalloproteinases - 4 (TIMP-4) in newborns with necrotizing enterocolitis (NEC).

METHODS
The study involved 88 newborns with NEC on stage 3. Concentrations of fecal calprotectin (FC), MMP-2 and MMP-9 and TIMP-4 in the blood serum with immune-enzyme method were determined.

MAIN RESULTS
In patients with various degrees of bowel involvement in the inflammation, the products of FC ($p < 0.01$) and MMP-2 ($p < 0.01$) exceeded control values. The increasing concentration of FC higher than 700 mg / g was accompanied by a high risk of bowel perforation. The deaths of patients with the symptoms of sepsis was accompanied by a significant ($p < 0.01$) increase of average concentration of TIMP-4 (2085 ng / ml) and MMP-9 (1032 ng / ml). As for the patients without the symptoms of sepsis and a fatal outcome, the concentration of TIMP-4 and MMP-9 were 1306 ng / ml and 668 ng / ml. It is shown that increasing concentrations of FC> 816 mg / g, MMP-2> 503 ng / ml, MMP-9> 812 ng / ml TIMP-4> 1404 ng / ml are associated with a high risk of fatal outcome.

CONCLUSIONS
Increasing concentrations of FC over 700 mg / g is associated with a high risk of bowel perforation. The progressive duration of NEC with the development of sepsis is characterized by the increase of serum concentrations of MMP-9, MMP-2 and TIMP-4.

BS16: MORPHOLOGICAL MARKERS OF FETAL CARDIOVASCULAR IMPAIRMENT ARE NOT ALTERED IN RIGHT-SIDED EXPERIMENTAL CDH

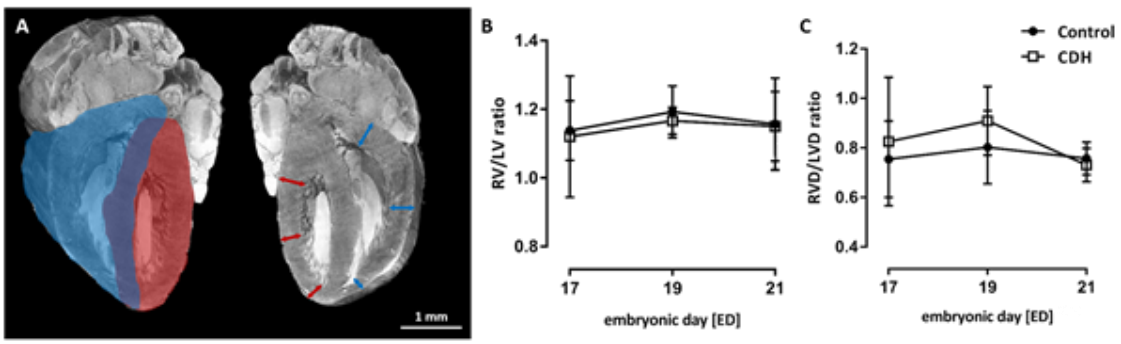
Moritz Markel[1], Marco Ginzel[1], Nicole Peukert[1], Hartmut Schneider[2], Steffi Mayer[1], Anne Suttkus[1], Martin Lacher[1], Dietrich Kluth[1], Jan-Hendrik Gosemann[1]
[1]Department of Pediatric Surgery, University of Leipzig, Leipzig, Germany. [2]Conservative Dentistry and Parodontology Clinic, University of Leipzig, Leipzig, Germany

AIM OF THE STUDY
Pulmonary hypertension (PH) determines severity of congenital diaphragmatic hernia (CDH). It is well known that microvascular remodeling contributes to PH in both left- and right-sided CDH. In left-sided CDH (L-CDH), morphological markers for fetal cardiovascular impairment such as ventricular-volume-ratios, wall-diameters and pulmonary-artery-diameters in relation to aortic-diameter (modified McGoon index,MGI) have been reported in rats on embryonic day (ED) 21. In right-sided CDH (R-CDH), morphological fetal cardiovascular changes have not been thoroughly investigated to date. The aim of our study was to evaluate longitudinal cardiac pathomorphological changes in nitrofen-induced R-CDH by micro-computed tomography (µ-CT).

METHODS
Fetal rats were exposed to either nitrofen (R-CDH) or vehicle (control) on ED11. Fetuses were harvested on ED17, 19 and 21 (n=5 per group; Ethics:TVV49/16). µ-CT scan was performed and right-ventricular-volume to left-ventricular-volume (RV/LV) ratio, right-to-left ventricular-wall-diameter (RVD/LVD) ratio as well as MGI were analyzed at $p<0.05$ (Fig.1A).

MAIN RESULTS
RV/LV ratio was comparable in controls and R-CDH on ED17 (1.1±0.2 vs. 1.1±0.1;$p>0.05$) and remained stable until ED21 (Fig.1B). RVD/LVD ratio was also similar in both group on ED17 and did not change over time (Fig.1C;$p>0.05$). The MGI on ED17 was 1.1±0.1 in controls and 0.9±0.1 in R-CDH ($p>0.05$) without significant change until ED21.

Figure 1



CONCLUSIONS
In contrast to L-CDH, longitudinal analysis of morphological markers for fetal cardiovascular impairment showed no differences between R-CDH and controls. These results suggest a more prominent role of microvascular remodeling for the pathogenesis of PH in experimental R-CDH.

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