

PAEDIATRIC SURGERY

PS001

FETOSCOPIC DIVISION OF LIMB AMNIOTIC BANDS

P. Z. BORZI, F. Y. CHAN, P. SHECKELTON, A. EDWARDS AND C. KIMBER

Mater Hospital, Brisbane, Queensland, Australia and Monash Medical Centre, Melbourne, Southern Health, Victoria, Australia

Isolated limb amniotic bands are rare. The timing of fetal surgery and outcome is unknown. Few isolated cases have been previously reported.

Methods Three fetuses underwent detailed ultrasound assessment and karyotyping for amniotic band syndrome. All three fetuses had isolated leg bands with gross distal oedema and compromised doppler flow. This was worsening in all cases over a four week period. Fetal surgery was offered and accepted by all 3 mothers after informed consent.

A double port technique was necessary for 2 operations whilst the final procedure was performed with a single 2 mm operating fetoscope. A combination of scissor dissection, laser, grasping and electrosurgery was required. Radially dilating ports were used to access the uterine cavity. All operations were performed between 26 and 27 weeks gestation.

Results No maternal or fetal complications occurred. All babies delivered spontaneously at term. Two additional toe amniotic bands were missed in 1 fetus.

There was marked improvement in foot oedema, doppler flow and movement in all 3 feet. All neonates required closure of the fetoscopically created wound. Two of the three affected limbs exhibit an excellent functional outcome.

Conclusions Fetoscopic amniotic band division for threatened limbs is feasible. Isolated cases have demonstrated significant reduction in limb swelling and improved doppler flow. Clinical improvement is possible with Large international series are required to determine the appropriate timing of intervention and outcome data.

PS002

LAPAROSCOPIC VERSUS OPEN PERITONEAL DIALYSIS CATHETER PLACEMENT IN CHILDREN

N. R. PRICE AND J. HAMILL

Starship Hospital, Auckland, New Zealand

Purpose The laparoscopic approach to peritoneal dialysis catheter (PD) insertion has been reported to offer advantages over the open approach. At our institution the laparoscopic approach has been used, by some surgeons, for elective PD insertion for the last 3 years. Have our surgical outcomes improved with this approach?

Methodology Retrospective review of all PD insertions for end-stage chronic renal failure (ESRF) over a five-year period, 2001 to 2005. Patients were identified using a prospectively collected renal database. Patients undergoing acute PD insertions were excluded. For laparoscopy, an open technique for insertion of the primary port, one 5 mm port at the exit site and two 3 mm working ports were used. Open surgery was non-standardised.

Results Twenty six children underwent PD insertion for ESRF, 16 open and 10 laparoscopic. The intervention free survival of the catheters was 5 of 16 (31%) versus 6 of 10 respectively, ($P = ns$). Excluding re-interventions for peritonitis and tunnel infections the surgical failure rate was 10 of 16 (62%) versus 1 of 10 respectively, ($P < 0.01$). Mean operating times were 57 and 61 minutes respectively.

Conclusions This retrospective review suggests a significant advantage to the laparoscopic technique of PD placement for ESRF in children.

PS003

TRAINING OPPORTUNITIES IN MINIMALLY INVASIVE SURGERY

J. WOOD AND E. LA HEI

Children's Hospital at Westmead, Sydney, New South Wales, Australia

Purpose Controversy exists regarding the amount of training required to safely perform minimally invasive surgical procedures. Basic minimally in-

sive techniques should be learned during general (adult) surgical training but opportunities vary widely between different programs. Advanced laparoscopic procedures often specific to a particular specialty are low volume cases and it can be difficult to learn the complex skill required in the operating theatre. We sought the opinion of ASTs in Paediatric Surgery regarding training opportunities in minimally invasive surgery.

Methodology A questionnaire consisting of 12 items was sent to all trainees in paediatric surgery registered in 2005.

Results 15/16 trainees responded. 8 from years 1–2 and 7 from years 3–6. Only 3 trainees from years 1–2 had performed 10 basic laparoscopic operations as the primary operator. Only 2 trainees in years 3–6 had performed 10 advanced laparoscopic procedures as the primary operator. Pressure on operating time, lack of support from theatre and anaesthetic staff and lack of cases were reported as contributing to this. Although 87% of trainees reported experiencing training in a skills lab only 13% reported currently having convenient access to such a facility. No trainees had experienced assessment of their skills lab training. All trainees felt they would be practising laparoscopic surgery in their career but 9/15 trainees expressed uncertainty as to whether their current advanced surgical training was preparing them adequately for this.

Conclusions Advanced surgical trainees in paediatric surgery perceive the need for improvements in training opportunities in minimally invasive surgery.

PS004

USE OF LAPAROSCOPY IN THE MANAGEMENT OF IMPALPABLE TESTES IN CHILDREN

S. Y. CHAO, K. K. W. LIU, B. P. Y. WONG, M. W. Y. LEUNG, K. W. CHUNG AND W. K. KWOK

United Christian Hospital, Hong Kong, China

Aim Management of impalpable testes (IT) is challenging. Laparoscopy has been widely used both in the diagnosis and treatment of IT. We reviewed our experience.

Method Records of children with IT were reviewed. Procedures included diagnostic laparoscopy, laparoscopic-assisted orchidopexy, Fowler-Stephens procedure and laparoscopic orchidectomy.

Results From January 2000 May 2005, 425 boys (aged 0–16 years) with undescended testes presented to our centre. There were 50 patients having 63 IT (median age = 20 months). IT was confirmed by examination under general anaesthesia. 21 patients (42%) had IT on the right, 16(32%) on the left and 13(26%) bilateral. During laparoscopy, intra-abdominal testes were found in 22, canalicular in 23, and upon subsequent inguinal exploration, vanishing testes in 18. Among the intra-abdominal testes, two were atrophic and removed laparoscopically. Seven testes were defined as high intra-abdominal (>2 cm from ipsilateral internal ring) and were managed with staged Fowler-Stephens procedure. Remaining 13 testes were low intra-abdominal (<2 cm from the internal ring) and were treated with laparoscopic-assisted orchidopexy. All canalicular testes were managed by conventional inguinal orchidopexy. All cases of vanishing testes were removed. Median follow-up period was 37 months. All testes except one were well positioned in the scrotum. 40 testes were similar in size compared to the contralateral testes while 3 remained smaller as preoperatively.

Conclusion Laparoscopy for the diagnosis and treatment of IT has become the method of choice for the management of IT. It allows an accurate diagnosis and definitive treatment in the same setting.

PS005

A TALE OF TWO STATES – LAPAROSCOPIC ANORECTOPLASTY

A. S. H. I. S. H. JAWANE, C. KIMBER, J. HUTSON, A. MACKAY, J. GILLICK AND P. BORZI

Mater Hospital, Brisbane, Queensland, Australia and Monash Medical Centre, Southern Health, Victoria, Australia

Purpose To review a large multicentre experience in laparoscopic anorectoplasty.

Methods Four major paediatric surgical centres (in 2 states (Queensland and Victoria) collaborated in a comprehensive retrospective review of all laparoscopic anorectoplasties performed since 1997.

Results 46 Infants aged 5 weeks – 12 months underwent laparoscopic anorectoplasty. Three of these were primary procedures (Q1d only), whilst the remainder ($n = 43$) required a neonatal stoma. Only eight of the 46 patients were female (3 cloacal, 5 high rectovaginal). Anatomical location of the fistula in males was rectovesical ($n = 5$), rectoprostatic ($n = 19$), rectomembranous ($n = 11$) or rectobulbar ($n = 3$). The intraoperative complications included faecal spillage ($n = 1$) and difficultly catheterizing ($n = 6$ with 2/6 undergoing open suprapubic catheter). There were no conversions from this technique. Post operative complications included urinary retention ($n = 2$), urine leak and recurrent pelvic sepsis ($n = 1$), retrimming of anal mucosa ($n = 6$) and wound infection ($n = 3$). There were no urethral strictures. Continence data remains limited in this young age group.

Conclusions Laparoscopic mobilization of high anomalies aides pull-through. Primary laparoscopic anorectoplasty has significant risks. The endoscopic approach is safe, with minimal complications and offers several dissection advantages over standard Pena style approaches.

PS006

FETOSCOPIC CORD LIGATION IN TWIN – TWIN TRANSFUSION: A BI-STATE EXPERIENCE

N. SAMNAKAY, T. ROBERTS, P. BORZI, A. EDWARDS, F. CHAN, C. KIMBER, R. KIMBLE, R. CINCOTTA AND P. SHECKELTON

Mater Hospital, Brisbane, Queensland, Australia and Monash Medical Centre, Southern Health, Victoria, Australia

Purpose Fetoscopic cord ligation largely been replaced by placental laser coagulation under fetoscopic control. Severe twin-twin transfusion has a mortality of up to 90% if left untreated with major neurological morbidity in the survivors. We reviewed the cord ligation experience at 3 major maternity centres with expertise in fetal surgery.

Methods All case of fetoscopic cord ligation performed at the Monash Medical Centre Victoria and two Queensland hospitals (Mater and Royal Women's) over a five year period (2000–2005) were reviewed. The fetal loss rate, perinatal outcome and maternal complications were documented. Fetoscopic difficulties were recorded.

Results After comprehensive fetal and maternal evaluation, 16 severe case of twin-twin transfusion underwent cord ligation. Two of these cases involved triplets. Average gestational age at procedure was 23 weeks (range 17–26) Bipolar diathermy or suture ligation was performed in all case under visual guidance using a 2 port approach (3 mm diam). Eleven of the 16 cases results in a liveborn singleton delivery. Four of the 12 were premature (27–31 weeks). There were 3 immediate complete fetal losses and 2 delayed losses (1 week later secondary to spontaneous labour). No major neurological abnormality has been detected in the surviving infants. Survival improved with operator experience.

Conclusions In our centres, fetoscopic cord ablation has a 69% success rate. This is comparable with other large international series. This technique still has a limited role in complex twin-twin disorders in particular short cords or stuck acardiac twins.

PS007

CUSTOMIZED OPERATING THEATERS FOR CHILDREN

J. G. TANTOCO, A. S. SPARNON AND H. L. TAN

Womens and Childrens Hospital, Adelaide, South Australia, Australia

Purpose The most recent advance in minimal access surgery (MAS) is the introduction of customized operating theaters. There is increasing interest with this technology among surgeons across different surgical specialties. A few have either acquired or have shown interest in building these theaters. In this study, we sought to describe our experience with the use of this theater with particular emphasis to its impact in paediatric surgery.

Methodology Operations performed during first 6 months of operation of our newly built operating theater were reviewed. Variables pertaining to the operation and theater turn over were analyzed. A survey of the staff, focused on variables impacting user satisfaction, was also conducted. A descriptive analysis of data collected will be presented.

Results There is a learning curve associated with the use of this new technology. Variables related to operating theater efficiency and user satisfaction gradually improved over time. Integration of the different equipments essential to MAS, excellent image resolution, flexibility of the system to

ergonomically adjust to different procedural set ups and ease of documentation were considered valuable justifications to its use and improved user satisfaction. No major technical and clinical issues were observed during the study period.

Conclusions The use customized operating theaters for children has the potential to further improve the operating room efficiency. Like MAS there is an associated learning curve. Despite of the paucity of good evidence, there is increasing demand for the use of this room coming from other surgical specialties in our centre.

PS008

EXPERIENCE WITH MULTIMEDIA PAEDIATRIC SURGERY CONSULTATIONS

J. G. TANTOCO, A. L. SPARNON AND J. FREEMAN

Womens and Childrens Hospital, Adelaide, South Australia, Australia

Purpose Advances in information technology have fundamentally changed the way patient information is exchanged among health care providers. Use of available Medias, e.g. internet, cell phones and digital imaging, in the field of paediatric surgery will not only facilitate access to paediatric surgeons but also make the process of paediatric surgical consultation convenient to both paediatric surgeon and the referring physician. In this study, we sought to determine if elective paediatric surgical consultation is feasible and reliable.

Methodology This is a collaboration between two paediatric surgery consultants and a surgical trainee. Consultations were achieved through the use of desktop computers with broadband internet access, cell phones and digital still camera. Patient data, diagnosis, and plan were exchanged using electronic mail with attachments and instant messaging or mobile calls.

Results A total of 20 cases, previously diagnosed and operated by another consultant, were selected for the consultation process. The cases represent a broad spectrum of common paediatric surgical conditions. Appropriate diagnosis and treatment plans were made on all cases. No major technical issues were noted during the consultation process.

Conclusions Paediatric surgical evaluation, diagnosis, and planning of treatment are feasible using multimedia paediatric surgical consultation. The protocol is easy to learn and allows accurate diagnosis and planning of a wide spectrum of paediatric surgical conditions. With more experience, this new modality has the potential to change landscape of surgical teaching, training and surgical decision making in the future.

PS009

THE IMPACT OF INTERFERENTIAL THERAPY ON PAEDIATRIC SLOW TRANSIT CONSTIPATION: MANOMETRIC EVIDENCE OF SUCCESS

S. K. KING, J. M. HUTSON, D. B. R. SOUTHWELL, I. COOK, P. G. DINNING AND A. CATTO-SMITH

Royal Children's Hospital, Melbourne, Victoria, Australia

Purpose Slow Transit Constipation (STC) is a poorly understood paediatric condition. Interferential therapy (IFT), applying electrical currents across the abdominal cavity, may successfully treat constipation. We assessed the impact of IFT on colonic motor patterns using our per-appendicostomy approach to 24 hr colonic manometry.

Methodology Two children (1 M 16 y; 1 F 18 y) with scintigraphically proven STC were studied. A manometry catheter was introduced to the colon via an established appendicostomy. The catheter was placed in the colon until 8 recording sites spanned from the caecum to sigmoid colon at 7.5 cm intervals. Both children subsequently underwent IFT for refractory symptoms. A repeat study was performed 7 months post-IFT.

Results Both children were 19 y at the time of repeat study and symptom-free. Contraction frequency (24 hr) for the 2 children respectively, pre- and post-IFT:

(1) Antegrade propagating sequences (APS) [40 vs 175; 11 vs 35]

(2) Retrograde propagating sequences (RPS) [41 vs 124; 6 vs 19]

(3) High amplitude propagating sequences (HAPS) [0 vs 11; 6 vs 3]

Contraction amplitude (mmHg) for the 2 children respectively, pre- and post-IFT:

(1) APS [25(3) vs 40(4); 80(7) vs 30(4)]

(2) RPS [36(4) vs 32(3); 21(4) vs 35(8)]

(3) HAPS [0 vs 83(15); 90(7) vs 84(14)]

Both children demonstrated significant area-under-the-pressure-curve increases post-IFT but didn't establish normal post-prandial and post-waking responses.

Conclusions Both children showed manometric improvements post-IFT, with increased sequence frequency and area-under-the-pressure-curve, suggesting reduced colonic dysmotility. This is the first paediatric study to demonstrate the impact of IFT using colonic manometry.

PS010 TREATMENT OUTCOMES FOR HEPATOBLASTOMA

J. P. ANG, S. KHURANA, S. DONATH, J. A. HEATH AND A. AULDIST

Royal Children's Hospital, Melbourne, Victoria, Australia

Objective To review a leading Australian tertiary referral centre's experience in treating hepatoblastoma over two decades.

Methods A retrospective study of hepatoblastoma patients treated at RCH between 1984 and 2004.

Results Thirty children ranging in age from 5 months to 6.5 years at diagnosis were reviewed. The median length of follow-up was 6.3 years. Twenty-nine patients underwent definitive surgery for primary tumour control. Of these, two had initial primary surgery, while 27 had delayed surgery following neo-adjuvant chemotherapy. Chemotherapy regimens included the SIOPEL study protocols. Patients not enrolled in SIOPEL tended to be given more courses of chemotherapy. Ten patients (34%) received an extended right hemi-hepatectomy, six (21%) had right hemi-hepatectomy, seven (24%) had left hemi-hepatectomy, three (10%) had left lateral segmentectomy, and two (7%) had a non-anatomical resection. In addition, two patients required IVC reconstruction at the time of their primary liver resection. Overall survival at 5 years was 89.1% (95% CI 69.8 to 96.4%). Event-free survival at 5 years was 75.7% (95% CI 53.2% to 88.5%). There was a clear increase in the risk of recurrence (RR = 4.8) and death (RR = 4.5) when margins were not microscopically clear. However neither reached statistical significance in this small cohort.

Conclusion Our experience suggests that the achievement of microscopically clear margins during primary tumour resection is an important factor in achieving a positive long-term outcome. In addition, extended courses of neo-adjuvant chemotherapy in patients with pulmonary metastases achieves good long-term outcomes, provided adequate surgical resection of the primary tumour can be achieved.

PS011 ADRENAL SIZE IN HIRSCHSPRUNG'S RATS IS EDNRB DOSE DEPENDENT

J. S. GUNDARA, L. CENGIA, C. LYNCH, D. T. CASS AND G. D. H. CROAKER

Canberra Hospital, Canberra, Australian Capital Territory, Australia

Purpose The lethal spotting rat (sl) is an animal model of Hirschsprung's disease (HSCR) associated with an endothelin receptor type-B (EDNRB) gene mutation. Extra-enteric neurocristopathy has not been investigated in the sl model. The adrenal gland is a prime candidate for examination, as it is practically accessible, a marker of neural crest cell development and holds clinical relevance (eg. neuroblastoma).

Methodology sl rats (Wistar-Imamichi AR strain) were sacrificed within 4 days of birth and nude body weight recorded. Adrenal glands were dissected bilaterally, weighed (left/right combined) and rat genotype determined (PCR methods).

Results 284 sl rats were examined (wild type-+/+: 86; heterozygous-sl/+: 144; homozygous-sl/sl: 54). Absolute adrenal weights demonstrated significant differences with genotype ($P = 0.02$) but not age ($P = 0.07$). sl/sl adrenals weighed the least (mean+/-SE: $4.29 \times 10^{-3} \text{g} \pm 0.21 \times 10^{-3}$; vs sl/+: $4.79 \times 10^{-3} \text{g} \pm 0.14 \times 10^{-3}$; $P = 0.13$ and +/+: $5.00 \times 10^{-3} \text{g} \pm 0.19 \times 10^{-3}$; $P < 0.01$). An absolute adrenal weight/genotype (expressed as 'gene dose') correlation was observed ($P = 0.02$). The genotype effect remained when controlling for age and BW (relative adrenal weight / %BW; $p < 0.01$); sl/sl possessing the smallest glands. The negative adrenal weight/genotype correlation was maintained ($P = 0.02$).

Conclusions These findings suggest an EDNRB gene dose effect in sl rat adrenals. Homozygous rats possess the smallest glands, possibly representing a neurocristopathy. Heterozygotes, although not aganglionic, are also affected. This effect requires further histological and biochemical investigation. The model may be of importance in understanding various neurocristopathies apart from HSCR, including neuroblastoma.

PS012 NEONATAL SMALL INTESTINAL ATRESIA IN NSW AND THE ACT FROM 1992-2001

C. F. TAYLOR, K. S. WALKER, C. HAMID, A. VORA, E. SHI AND N. BADAWI

Prince of Wales Hospital, Sydney, New South Wales, Australia

Aim To conduct a comprehensive audit of events, complications and outcomes of infants diagnosed with small intestinal atresia.

Methods Analysis of the outcomes of all infants admitted with small intestinal atresia to one of the 10 tertiary neonatal intensive care units within NSW and the ACT between January 1992 and December 2001. Infants were identified using the prospectively collected NICUS database using ICD 9 and ICD 10 codes, unit databases and hospital medical records.

Results There were 154 babies with small intestinal atresia admitted in NSW and the ACT over an eleven year period from 1992-2001, giving an incidence of 1.6 per 10 000 live births. There were 87 males (56.5%) and 85 (55%) babies were born prematurely (<36 weeks of gestation) with the majority (88.2%) born after 32 weeks of gestation. The median birth weight was 2688 g (range 705 to 4770 g). There was a substantial mortality rate with 15 of the 154 (10%) babies dying. The average age at which the infants died was 107 days (range 3-463 days). Deaths were attributed to sepsis, short bowel, multiple anomalies with several children dying at home after discharge. Nearly half the babies $n = 74$ had associated anomalies, with the most frequent being malrotation (20%), non-syndromic dysmorphism (19%) and chromosomal anomalies (19%).

Conclusions To date this is one of the largest regional audits of small intestinal atresia undertaken in Australia. While this condition is associated with significant co-morbidities, the mortality has decreased substantially to 10% in the last decade.

PS013 INSPISSATED MILK SYNDROME IN THE EXTREME LOW BIRTH WEIGHT PREMATURE INFANT - A VARIANT OF NECROTISING ENTEROCOLITIS?

S. ADAMS, G. HENRY, E. SHI AND R. DAS GUPTA

Sydney Children's Hospital, Sydney, New South Wales, Australia

Purpose Milk bolus obstruction or Inspissated Milk Syndrome (IMS) was first recognised as a clinical entity more than forty years ago, when reconstituted cows milk powder was widely used. The present study reviews our experience with IMS in the era of increasing survival of extreme low birth weight (ELBW) premature infants.

Methodology During the period January 2005 to January 2006, neonates with intestinal obstruction were identified using the prospectively kept neonatal database. The medical records of the subset of neonates with Necrotizing enterocolitis (NEC) were reviewed, including demographic data, clinical presentation, radiological, operative and histological findings.

Results During the study period, there were 31 neonates with intestinal obstruction. NEC in babies with gestational age less than 25 weeks and/or birth weight less than 1000 g accounted for 9 cases. Three out of 9 had clinical, radiological and operative features consistent with bolus intestinal obstruction. All required operation and all survived. The histology showed features of NEC. Of the remaining 6 patients with classical features of NEC, 3 (50%) died.

Conclusion The subset of neonates with bolus obstruction and segmental small bowel NEC correlates with IMS as described in the literature. As with isolated ileal perforation, the authors believe that inspissated milk syndrome in the low birth weight premature infants, represents a variant of NEC. It is important to identify this group because although they all require an operation, the survival is excellent.

PS014
INDICATIONS OF GASTROSTOMY FOR OESOPHAGEAL ATRESIA +/- TRACHEO-OESOPHAGEAL FISTULA IN THE NEW MILLENNIUM

S. ADAMS, E. SHI AND R. DAS GUPTA

Sydney Children's Hospital, Sydney, New South Wales, Australia

Purpose Gastrostomy as a routine adjunct procedure for Oesophageal Atresia with or without Tracheo-oesophageal Fistula (OA+/-TOF) is no longer recommended in the last two decades. This study examined the indications and relevance of gastrostomy for OA+/-TOF in the new millennium.

Methodology A prospective database of OA+/-TOF patients has been kept at Sydney Children's Hospital since 1980. This study reviewed the patients from the database treated over the 6 year period between January 2000 and December 2005. The indications and timings of gastrostomy were examined. The relevance of gastrostomy was correlated to the outcomes, in particular, stricture rate and the subsequent need for fundoplication.

Results There were 12 gastrostomies performed amongst 50 OA+/-TOF patients identified within the 6 year period. 4 patients had pure OA and all 4 had a primary gastrostomy. Of the 5 patients who had OA + TOF and were born less than or equal to 32 weeks gestation, 3 had a primary gastrostomy. There were 5 secondary gastrostomies performed in conjunction with a fundoplication. 8 of the 12 patients with gastrostomies developed oesophageal stricture requiring subsequent dilatations.

Conclusions Primary gastrostomy remains the accepted management strategy for patients with pure OA and more than half of the extremely premature infants have benefited from the procedure. Secondary gastrostomy is reserved for patients who have life threatening gastro-oesophageal reflux requiring a fundoplication. The high stricture rate in patients with gastrostomy is related to pure OA and gastro-oesophageal reflux. Gastrostomy is still a useful adjunct in selected patients with OA+/-TOF in the new millennium.

PS015
THE HIDDEN MORTALITY OF GASTROSCHISIS – HOW DO WE LESSEN THE RISK?

P. FERGUSON, R. BRENT, G. WILSON AND C. KIMBER

Monash Medical Centre, Melbourne, Victoria, Australia

Purpose To examine the causes of mortality in gastroschisis, compare with other published literature and discuss strategies in preventing in utero mortality.

Methodology A retrospective review of all gastroschisis from our institution between January 1998 and December 2005. Including all cases that attended the fetal diagnostic unit antenatally at Monash Medical Centre, perinatal transfers, and incidental findings of gastroschisis as a result of termination of pregnancy. Fetuses were assessed with regular ultrasound and assessment by both surgeon and obstetrician.

Results 36 cases of gastroschisis are examined. Two (6%) incidental diagnoses were made following spontaneous abortion. Seven (19%) pregnancies were terminated, one by endoscopic selective cord ligation following twin to twin transfusion, two (6%) late 3rd trimester deaths, one (3%) perinatal death attributable to an antenatal insult, and one (3%) post natal death. Excluding terminations the mortality was 4/27 (15%) the majority of which were attributable to antenatal causes.

Conclusions The risk of late 3rd trimester or perinatal mortality is more significant than neonatal mortality. We discuss antenatal management and recommend selective earlier delivery of pregnancies in the third trimester, to improve survival.

PS016
EXIT PROCEDURES IN THE MANAGEMENT OF FETAL 'CHAOS'

G. M. HENRY AND I. JACOBSEN

Sydney Children's Hospital, Sydney, New South Wales, Australia

Purpose We wish to report our experience in managing 4 cases of congenital high airway obstruction syndrome considered for the EXIT (Ex Utero Intra Partum) procedure.

Methodology We have reviewed retrospectively the records of our four cases that have been seen and managed in our institution over the period from 1998 to 2005.

Results Four cases were diagnosed antenatally with high airway obstruction and deemed suitable to undergo management by an EXIT procedure. These were one cervicopharyngeal teratoma, two lymphangiomas and one laryngeal atresia. All showed evidence of polyhydramnios and airway obstruction on MRI. One case subsequently could not be managed due to the placental position and this child unfortunately succumbed. In the remaining three cases a live child was produced at the end of the delivery following a successful EXIT procedure.

Conclusion The EXIT procedure is the treatment of choice in cases of CHAOS. These should only be attempted in institutions with a full range of obstetric and paediatric services. Careful planning and rehearsal before the day is essential to guarantee a good outcome.

PS017
STOMAL COMPLICATIONS FOLLOWING SURGERY FOR NECROTISING ENTEROCOLITIS

N. J. EVENNETT, F. A. M. V. I. HELLENTHAL, G. H. SIE, L. W. E. VAN HEURN AND E. HEINEMAN

Academisch Ziekenhuis Maastricht, Limburg, Netherlands

Purpose The traditional surgical approach to necrotising enterocolitis (NEC), involving resection of necrotic bowel and proximal enterostomy, has been challenged by several papers advocating the safety of primary anastomosis. As we have continued to perform enterostomies routinely in the surgical management of NEC, we performed a retrospective analysis of stomal complications in neonates treated for NEC at our institution.

Methodology From January 1993 till January 2004, 35 stomas were formed in 33 patients afflicted by NEC. Perioperative data were collected retrospectively and where possible, the severity and distribution of NEC was established to predict the suitability for primary anastomosis. Stomal complications during formation, management and closure were recorded.

Results Complications at any stage of the history of the stoma occurred in 71% (25/35) of the patients, including during formation (9/35, 26%), management (15/35, 43%) and closure (16/35, 46%). Serious complications, including wound dehiscence, stomal prolapse, herniation and restenosis occurred in 46% (16/35). The overall mortality rate was 11.4% (4/35). One death was partly attributable to complications relating to closure of the stoma. It was possible to retrospectively evaluate the severity of NEC in 27 patients, 18 of which (66.7%) had focal disease that was likely suitable for primary anastomosis. The stomal related morbidity in this group remained high at 80%.

Conclusion There is a high morbidity associated with stoma formation for NEC, including those neonates who may have been suitable for primary anastomosis. This lends further support to the role of primary anastomosis following intestinal resection in NEC.

PS018
LONG-GAP OESOPHAGEAL ATRESIA (LGOA): FIVE PATIENTS TREATED WITH PRIMARY GASTRIC TUBE

J. C. PATTILLO, K. FERGUSON, J. CRAMERI AND A. AULDIST

Royal Children's Hospital, Melbourne, Victoria, Australia

Purpose To review the experience with oesophageal replacement using a primary gastric tube in the management of LGOA.

Results From 1949 to 2005, 810 patients with oesophageal atresia and/or tracheo oesophageal fistula have been admitted to the RCH. Sixty-six (8.1%) presented a LGOA. From 1990 to 2004, 25 have been treated. Five patients have had a primary replacement of the oesophagus with a gastric tube. One of those had an anastomotic leak and 4 had strictures. All of them had variable degrees of gastro oesophageal reflux. There was no mortality in the series. In the long term the patients remain well, with satisfactory function of the gastric tube.

Conclusion Primary replacement of the oesophagus with a gastric tube is our preferred option in the management of LGOA when no primary anastomosis is possible.

PS019 THE ROLE OF LAPAROSCOPY IN TRAUMA

G. R. CHRISTEY

Hamilton, New Zealand

The major role of laparoscopy in stable penetrating trauma patients is to screen for breaches of the parietal peritoneum or diaphragm in order to prevent unnecessary laparotomies. Laparoscopy is excellent for diagnosing haemoperitoneum, solid organ injuries and retroperitoneal haematomas, but has low sensitivity (about 20%) for enteric injuries¹. Missed enteric injury may have severe or life-threatening consequences and should be excluded by laparoscopy if the peritoneum has been breached.

The role of therapeutic laparoscopy is not yet well defined but many authors have reported acceptable results in repair of the diaphragm, liver, bladder and a wide range of other organ injuries^{2,3}. The efficacy of therapeutic laparoscopy is likely to improve as technology and surgical expertise evolve.

In blunt abdominal trauma laparoscopy may be useful in excluding diaphragmatic injury and in assessing non-bleeding injuries for non-operative management after positive peritoneal lavage or computerized tomography, however its invasiveness and high cost preclude routine use⁴.

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PS020 TREADMILL RELATED INJURIES IN PAEDIATRIC PATIENTS AND A LITERATURE REVIEW

N. J. JEFFERSON, P. ROME, S. NICKLIN AND S. ADAMS

Sydney Childrens Hospital, Sydney, Randwick, New South Wales, Australia

Purpose Audit treadmill related injuries in paediatric patients and perform a literature review.

Methodology Patients were identified on the trauma database and the Emergency Department Information System (EDIS). The patients' records were then reviewed.

Over a five-year period, there were 15 injuries in 11 children caused through contact with treadmills treated at Sydney Children's Hospital, Randwick, more than half of which occurred in the last 2 years. Males accounted for almost two-thirds (64%) of all presentations. The average age was 3.8 years, with a median age of 2, (range 1–12). The majority of injuries occurred in the home (91%). 82% of injuries were to the upper limb, including a partially amputated finger, and a degloving injury to the hand. 72% of patients suffered friction burns and half of which were full thickness. All injuries required specialised wound care and two required admission and operation.

Conclusion The authors have observed an increase in incidence of treadmill related injuries in a 5 year period which may be correlated with the increase in number of treadmills in homes. While there are strict occupational health and safety regulations in the workplace covering conveyer belts, no such regulations apply to domestically placed machines. The authors discuss mechanisms of injury, management, and offer suggestions on prevention.

PS021 MAJOR CIRCUMCISION INJURIES: A PERSONAL EXPERIENCE

S. AHMED

Princess Margaret Hospital for Children, Perth, Western Australia, Australia

Circumcision is one of the most frequently performed surgical operations in children. It is commonly performed for religious, tribal or social reasons and rarely, there are clinical indications too. Circumcision is not a minor procedure

and should be performed carefully by suitably trained surgeons. However, the procedure is often performed by qualified but not surgically trained doctors and also by lay personnel, specially in the religious and tribal circumcision group.

Complications following circumcision are numerous; may be minor or may cause serious morbidity and even mortality. It is almost universal that the complications are not managed by the original 'surgeon' who may not even be aware of the problem.

In this paper the author illustrates 6 major circumcision injuries. Included were one child with multiple urethral fistulae, one with a major chemical burn, two with penile gangrene, one with a 'constricting band' penile injury and one with mid – shaft amputation.

The surgical management of the 6 cases is presented together with the results.

PS022 PAEDIATRIC FLEXIBLE URETERORENOSCOPY AND LASER LITHOTRIPSY

W. C. YEOW AND A. P. BARKER

Princess Margaret Hospital for Children, Perth, Western Australia, Australia

Purpose Flexible ureterorenoscopy and Holmium laser lithotripsy are established in the management of adult upper urinary tract disorders, but these techniques are only now being used with increasing frequency in children. We report our experience with 25 cases of paediatric upper urinary tract disorders treated using these techniques.

Methods Between the years 1997 to 2005, flexible ureterorenoscopy was performed in 25 children (12 females and 7 Aboriginal) aged between 3 months and 15 years with a mean age of 8 years. 24 of 25 were stented prior to undergoing ureterorenoscopy. 24 presented with suspected upper tract stones (17 pelvicalyceal and 7 mid-ureteric). One case had ureterorenoscopy to remove a broken JJ stent post-pyeloplasty.

Results Eight cases were diagnostic procedures. Six excluded the presence of renal calculi, one had focal medullary sponge kidney, and one had a calcified papillae. There were 14 cases of therapeutic ureterorenoscopy. Of these, 12 had laser lithotripsy with only one with incomplete stone fragmentation, which subsequently passed spontaneously. Other therapeutic procedures were removal of JJ stent fragment and basket removal of a mid-ureteric calculus. Three cases failed ureterorenoscopy due to technical difficulties. The overall success rate was 88% for diagnostic and therapeutic ureterorenoscopy.

Conclusions Flexible ureterorenoscopy and laser lithotripsy are valuable minimally invasive techniques for examination of the paediatric upper urinary tract for suspected calculi and for the management of calculi present. Preoperative stenting improves passage of the ureteroscope and with progressive miniaturization of instruments, the lower weight limit will decrease.

PS023 ROLE OF TENSION FREE VAGINAL TAPE (TVT) PROCEDURE IN PAEDIATRIC MYELODYSPLASIA NEUROGENIC BLADDER

P. K. GERA AND A. BARKER

Princess Margaret Hospital for Children, Perth, Western Australia, Australia

Purpose To assess the role of Tension free vaginal tape procedure in Paediatric myelodysplasia neurogenic bladder.

Methodology 3 patients with diagnosis of myelodysplasia neurogenic bladder were operated. These patients had dribbling of urine inspite of being on clean intermittent catheterisation. Urodynamic studies showed Intrinsic sphincter deficiency.

TVT procedure was performed under GA. A TVT device consists of polypropylene mesh covered by a plastic sheath and held between two stainless steel needles. TVT procedure involves two small abdominal incisions just above pubic symphysis & a small incision on anterior vaginal wall shaped sling with tape placed flat against the posterior surface of mid urethra. Cystoscopy was done to confirm the anatomical integrity of bladder and urethra.

Results Follow up ranged from 4 year to 5 years. All the 3 patients were dry and are on clean intermittent catheterisation regimen after TVT procedure.

Conclusion We consider the TVT system as an effective surgical technique in the treatment of the Paediatric myelodysplasia neurogenic bladder. It is a simple technique with a short stay in the hospital.

PS024
ROLE OF REAL TIME ULTRASOUND (BIOFEED BACK) IN
BLADDER DYSFUNCTION IN CHILDREN

P. K. GERA, A. BARKER AND C. ANASTAS

Princess Margaret Hospital for Children, Perth, Western Australia, Australia

Purpose The ability to control the pelvic musculature is a very important tool in establishing and maintaining continence and normal voiding patterns for many children with bladder dysfunction. Dysfunctional voiding is the inability to relax the pelvic floor during micturition, resulting in abdominal straining and high pressure voiding patterns, with inherent risk of urinary retention, urinary tract infection and renal involvement. Successful treatment programs include training in pelvic floor relaxation during voiding to allow for appropriate emptying patterns.

Methodology 10 patients were studied at Princess Margaret hospital of Children with biofeedback and Real time ultrasound (RTUS). We assessed the benefit of using RUTS & biofeedback as an adjunct to teaching children to relax their pelvic floor during micturition.

Results 8/10 patients had significant improvement in terms of symptomatology and residual urine. 1 patient was lost to follow up.

Conclusion Biofeed back (RUTS & verbal training) is successful in improving the bladder emptying in children with bladder dysfunction.

PS025
BLADDER EXSTROPHY IN AUSTRALIA 1995–2005

D. CARROLL AND H. JEFFERIES

Royal Children's Hospital, Melbourne, Victoria, Australia

Purpose Bladder exstrophy is a rare congenital condition. We set out to examine the experience of Bladder exstrophy in Australia over the last ten years in particular outlining common complications, incidence and continence outcomes for this group of patients.

Methodology A retrospective notes review of all patients born with bladder exstrophy, bladder exstrophy variant and cloacal exstrophy was conducted in each state in Australia.

Results Between 1995 and 2005 76 patients born with classic bladder exstrophy (60), bladder exstrophy variant (5) or cloacal exstrophy (11) were treated in paediatric surgical centres across Australia. All patients with bladder exstrophy or bladder exstrophy variant are still alive and two patients with cloacal exstrophy died. In patients with classic bladder exstrophy or bladder exstrophy variant (65) the majority of patients are incontinent (35), 14/65 patients were dry and voiding spontaneously and 10/65 patients were continent with clean intermittent catheterisation. In 6 patients the continence outcome was not recorded. Complications are commonplace and wound dehiscence is the commonest major complication following primary closure. The overall incidence of bladder exstrophy or cloacal exstrophy is approximately 3 per 100 000 live births, which is similar to that reported in the US.

Conclusions Bladder exstrophy and cloacal exstrophy remain rare conditions in Australia. Achievement of continence in the first decade of life is uncommon, although continence is possible with clean intermittent catheterization. Complications and multiple operations are commonplace.

PS026
ASSESSMENT OF COOLING ON AN ACUTE BURN WOUND IN A
PORCINE MODEL

J. YUAN, C. WU, J. HARVEY, A. J. A. HOLLAND, H. C. O. MARTIN AND
E. R. LA HEI

Children's Hospital at Westmead, Sydney, New South Wales, Australia

The current recommended management for an acute burn is to apply cool running water for 20 minutes (ANZBA, 2004). In clinical practice, the use of wet towels and water spray are also frequently used. No scientific data exists to compare the effectiveness of these methods of cooling.

Ten piglets were studied. Under general anaesthesia, a partial thickness burn injury was induced using water at 81.3 (+/- 4.1) degrees Celsius applied for 15 seconds; one of 4 treatment modalities was then applied for 20 minutes. Treatment arms included a control site (no treatment), cool running water, wet towel and water spray. Biopsies and digital photographs were

taken on Day 1 and 9 post-injury and treatment. The samples were reviewed and rated by 2 blinded assessors. Based on histological findings by a blinded senior pathologist, the outcome of control group (no treatment) was either worse or showed no change in depth of injury over 9 days. Results in using water spray and wet towel treatment group were variable. Cool running water applied to the burn consistently demonstrated improvement in wound recovery after 9 days ($P < 0.05$).

We conclude that cold running water is significantly the most effective form of first aid treatment for the acute burn wound. We aim to use these results to guide the development of public health education in the management of the acute burn injury.

PS027
BURNS TREATMENT FOR CHILDREN: A COMPARATIVE STUDY
OF INITIAL BURNS FIRST AID, HOSPITAL CARE AND CHANGES
FOLLOWING AN EDUCATION CAMPAIGN

B. G. PEAT, M. J. MULLER AND A. M. SKINNER

Starship Children's Hospital, Auckland, New Zealand

Purpose To assess adequacy of burns first aid treatment (BFAT) among children, its impact on treatment outcome and the effect of a community burns awareness campaign on initial burn management.

Methodology 4 month prospective study of all paediatric burn patients presenting acutely (Study 1). This study was repeated of same population over same months 4 years later (Study 2). Patients/care-givers were interviewed regarding initial BFAT and assessed for adequacy. Treatment progress was followed. Extensive multi-media community burns awareness campaign was conducted between Study 1 and 2.

Results Study 1 enrolled 20 outpatients/40 inpatients. Study 2 enrolled 59 outpatients/27 inpatients. There was over-representation of Pacific Islanders (27%) and Maori (20%) compared to general population distributions 13% and 12% respectively. Almost 50% of both studies were children under 5 years and scalds were commonest type of burn (40%). Adequate BFAT was 30% in Study 1 vs 63% Study 2. Post-campaign there were fewer inpatient procedures and less surgery. Changes indicated increased aBFAT for outpatients and fewer inadequately treated inpatients. Proportions of outpatients to operations were significant ($P \leq 0.001$). Skin grafting scalds reduced 20%-4% with aBFAT ($P = 0.003$). Lower socio-economic suburbs and racial concordance was seen in burn numbers and both studies indicated majority inpatients received inadequate BFAT adversely effecting outcome, increasing health care costs.

Conclusions BFAT improved post-campaign with high risk Maori and Pacific Island populations showing the greatest change. Adequate BFAT does improve wound outcome with scalds showing the greatest response.

PS028
FINDING PREDICTORS OF LAPAROTOMY IN CHILDREN
PRESENTING WITH INTUSSUSCEPTION – A FIVE-YEAR
RETROSPECTIVE REVIEW AT PRINCESS MARGARET
HOSPITAL, PERTH, WESTERN AUSTRALIA

I. GOLLOW, J. ORFORD, P. K. GERA, M. MORRIS, J. KELLY AND
J. K. KUTHUBUTHEEN

Princess Margaret Hospital for Children, Perth, Western Australia, Australia

Background Intussusception is the most common cause of intestinal obstruction in infants and young children. Urgent air enema reduction of the intussuscepted bowel is required in order to prevent strangulation and the need for laparotomy.

Methods A retrospective review of patients at Princess Margaret Hospital diagnosed with intussusception from January 2000 to September 2005 was performed. Children who required a laparotomy were assessed with respect to symptoms, examination findings and demographics and compared to those patients who had a successful air enema reduction or spontaneous reduction of the intussusception.

Results 115 cases of intussusception in 112 patients were identified, with 31 patients requiring a laparotomy. The presence of vomiting, abdominal pain and blood in the stool, the classical triad of intussusception, was more common in patients who required a laparotomy ($P < 0.05$). The presence alone of a fever, blood in the stool, a history of altered bowel habit or

presence of dehydration occurred in a significantly higher proportion of patients who eventually required laparotomy ($P < 0.05$).

Conclusion The classical triad of intussusception is a significant predictor of a child with intussusception who may require a laparotomy. The presence alone of fever, blood in the stool, dehydration or a history of altered bowel habit is also a significant predictor of patients who eventually require laparotomy.

PS029
NON-TUBERCULOUS MYCOBACTERIAL INFECTION IN AUSTRALIAN CHILDREN: A NATIONAL SURVEILLANCE STUDY

C. C. BLYTH, P. PALASANTHIRAN, E. J. BEST AND G. HENRY

Sydney Children's Hospital, Sydney, New South Wales, Australia

Purpose The incidence and natural history of non-tuberculous mycobacterial (NTM) infections in Australian children is unknown. Our aims were to estimate its incidence and describe the spectrum of disease, risk factors, diagnosis, management and response to therapy.

Methodology From July 2004 to December 2005, paediatricians and surgeons on the Australian Paediatric Surveillance Unit's mailing list were asked to notify children seen with NTM infection. Clinicians were sent questionnaires.

Results The response rate was 80%. Of 90 notifications, 44 were included. Twenty-eight notifications were excluded; 11 diagnosed before the study date, 8 failed to meet diagnostic criteria and 9 duplicated/incorrect notifications. The median age was 2.9 years (1.1–14.2 y). Only 6/44 (14%) had predisposing medical conditions. Lymphadenopathy was present in 31/44 (70%), and 5 had associated skin/soft tissue infection. Isolated skin/soft tissue infection was present in 5 cases and 2 had bony disease. In localised disease constitutional symptoms were rare. Biopsy was performed in 37/44 (84%). An organism was isolated in 27 cases. Surgery was performed in 33/44 (75%); excision (22 cases), curettage (10 cases) and incision/drainage (1 case). Antibiotics were prescribed in 19/44 (43%). The recurrence rate was 40% following curettage. No recurrences occurred following excision. Post-operative nerve injury was seen in one case.

Conclusions The incidence of NTM infection in Australian children is 0.74 cases/100 000. It occurs most frequently in young children without predisposing conditions. Lymphadenopathy is the most frequent presentation. There is significant variation in therapies given with recurrences occurring following curettage.

PS030
SPLenic TRAUMA IN CHILDREN: SETTING A STANDARD OF CARE

S. LI, D. HOON, R. DANSEY, R. TEALE AND J. HAMILL

Starship Children's Hospital, Auckland, New Zealand

Purpose Although non-operative management of splenic trauma in children is well established and highly successful, recent literature demonstrates significantly higher splenectomy rates at non-specialist compared to specialist paediatric surgical institutions. The aim of this study is to document the splenectomy rate at a paediatric trauma centre.

Methodology Retrospective review of all children admitted to a paediatric trauma centre with splenic injury over an 11-year period, 1995–2005 inclusive. Two children underwent splenectomy another institution prior to transfer and were excluded.

Results A total of 148 children were admitted of which 105 (70%) were boys. The median age was 8 years. Two injuries resulted from stabbings; in one splenorrhaphy was performed and the other was treated conservatively. Of the remaining 146 blunt trauma patients 3 (2%) underwent splenectomy. Splenectomies occurred in the years 1996, 1998 and 2004 respectively. Two children had emergency laparotomy for cardiovascular instability and other intra-abdominal injuries. The third had a delayed haemorrhage after 48 hours of conservative management. The splenic abbreviated injury score was 5 for all three children. All recovered well. Of the entire group 6 died, all from major head injuries.

Conclusions A splenectomy rate of 2% sets a standard of care. Early paediatric surgical consultation is recommended for children with splenic trauma presenting to a non-paediatric surgical hospital.

PS031P
UNEXPECTED FINDINGS WITH INGUINAL LAPAROSCOPY

G. M. HENRY

Sydney Children's Hospital, Sydney, New South Wales, Australia

Purpose Inguinal laparoscopy at the time of herniotomy is accepted as a useful technique for finding a contralateral hernial sac. We report two cases of unexpected pathological findings noted at the time of laparoscopy.

Methodology We reviewed retrospectively the records of two cases that have been managed by the author.

Results Two cases of unusual pathology have occurred in the practice of the author who routinely places a laparoscope through the hernial sac to assess for a contralateral hernia. One was a 5 year old boy with multiple peritoneal and omental seedlings which was subsequently diagnosed as a calcifying pseudotumour. The second case was a 8 month old child noted to have a nodule of firm tissue within a contralateral hernial sac and at open repair a biopsy was taken and suggested neuroblastoma. This was confirmed on subsequent investigation.

Conclusion Inguinal hernias are common and laparoscopy is useful in assessing the contralateral side; it may prevent you from exploring the other side unnecessarily; it may also demonstrate some unusual pathology!

PS032P
SUBSTANCE P DEFICIENCY AND COLONIC MOTILITY IN PAEDIATRIC SLOW TRANSIT CONSTIPATION

S. K. KING, J. M. HUTSON, B. R. SOUTHWELL, I. COOK, P. G. DINNING AND A. CATTO-SMITH

Royal Children's Hospital, Melbourne, Victoria, Australia

Purpose Slow Transit Constipation (STC) is a poorly understood paediatric condition. A possible aetiology is a Substance P (SP) deficiency in colonic circular muscle. Utilising colonic manometry we assessed the impact of SP deficiency upon colonic motor patterns in severely constipated children, all with abnormal colonic motility shown on colonic manometric studies.

Methodology In 17 children (12 M, mean 11 y, range 6–18 y) with scintigraphically proven STC (8 with SP deficiency) a manometry catheter was introduced to the colon via an established appendicostomy. An inflated catheter-tip balloon progressed the catheter through the colon until 8 recording sites spanned from the caecum to sigmoid colon or rectum at 7.5 cm intervals.

Results When compared with constipated children with normal SP density, constipated children with SP deficiency demonstrated a similar frequency of antegrade [30(7) vs 30(6)], retrograde [11(4) vs 17(6)] and high amplitude [7(3) vs 5(2)] propagating sequences. Overall the amplitude, velocity and extent of propagating sequences did not differ between the groups. Neither group demonstrated the expected increase in colonic motility post-prandially nor post-waking.

Conclusions STC children with normal circular muscle SP density are manometrically indistinct from those with SP deficiency. The data suggest either that the underlying defect causing dysmotility is unrelated to SP deficiency (SP deficiency is a marker of disease) or that there are other causes of paediatric STC in addition to SP deficiency. The defect is likely to be in the colonic pacemakers rather than in the muscle.

PS033P
ULTRASOUND DIAGNOSIS OF INFANTILE HYPERTROPHIC PYLORIC STENOSIS IN 187 INFANTS

R. L. HADDAD, N. FORSTER, A. V. DILLEY AND J. PERIERA

Prince of Wales and Sydney Children's Hospitals, Sydney, New South Wales, Australia

The purpose was to evaluate the diagnostic efficacy of ultrasound (US) in the diagnosis of infantile hypertrophic pyloric stenosis (IHPS) with particular attention paid to whether prematurity, age or weight correlate significantly with the sonographic measurements. The medical records of 187 infants were reviewed retrospectively, of which 87 had an US examination, and 59 of these gave a positive diagnosis. The US criteria for a positive diagnosis were pyloric muscle thickness (PMT), ≥ 3 mm, and pyloric muscle length (PML), ≥ 17 mm. The mean overall PMT was 4.14 mm, and mean overall PML was

18.99 mm. Premature infants had a lower mean PML (17.8 mm) than the term infants (PML mean 19.3 mm), however this was not significant (t -test 1.92, P 0.062). The sensitivity and specificity of PMT 91% and 85%, respectively, and of PML 76% and 85%, respectively. The ability of US to diagnose IHPS using our criteria was significant (t -test, PMT 14.93 and PML 6.89; P < 0.0001). There was no significant correlation between age, weight, or prematurity and a sonographic diagnosis of IHPS (Pearson's coefficient <0.3). Therefore, the same US criteria should apply irrespective of prematurity, age, or weight. Borderline PMT and PML measurements necessitate repeat US or alternate imaging.

PS034P LIFE THREATENING PAEDIATRIC LIVER INJURY

J. WOOD, S. V. SOUNDAPPAN, G. M. HENRY, J. CASSEY, A. SHUN AND D. T. CASS

Children's Hospital at Westmead, Sydney, New South Wales, Australia

Purpose Life threatening paediatric liver injury is rare but remains one of the most significant surgical challenges. Non operative management is indicated in all but exsanguination. When operative management is attempted a rapid and coordinated response by the trauma team and other ancillary support is essential.

Methodology We reviewed three similar cases of blunt abdominal trauma. Each resulted in life threatening haemorrhage. One case was managed non-operatively. Operative salvage was attempted in the others. The efficacy of the respective trauma codes in each institution was reviewed.

Results The one child who survived was managed non-operatively but required meticulous and repeated assessment in an intensive care setting. In the remaining cases operative management was unsuccessful but highlighted the need for rapid simultaneous resuscitation and surgery in the operating theatre suite and the crucial role of a timely response of the blood bank.

Conclusions Management of major paediatric liver injury relies on the rapid, rehearsed and coordinated response of a multidisciplinary trauma team.

PS035P A NEW PORCINE MODEL FOR MINIMALLY INVASIVE INTRAVESICAL SURGERY

J. WOOD AND R. C. COHEN

Children's Hospital at Westmead, Sydney, New South Wales, Australia

Purpose Intravesical minimally invasive bladder surgery (IMIBS) is becoming more widely accepted. Its development has largely been in the clinical setting and its advantages here have been demonstrated. The pig is established as a good urological model, but the close anatomical relationship of the bladder and peritoneum mean its use as a model for IMIBS is often complicated by pneumoperitoneum. Our study aimed to eliminate this.

Methodology In 10 pigs the peritoneum was carefully maintained intact and dissected from the ventral and superior surface of the bladder. The bladder was then hitched to the posterior aspect of the overlying rectus muscle so the peritoneum was excluded from between it and the overlying skin. This also helped to stabilise the bladder for later port insertions. In three early animals non absorbable sutures were used.

Results All the animals recovered from surgery and the bladder remained free of the peritoneum. The three animals in which a non absorbable suture was used developed a subcutaneous abscess which distorted the bladder making intravesical surgery impossible. In the remaining seven animals, where absorbable sutures were used, it was possible to create a pneumovesicum and enter the bladder with 3 ports without development of a pneumoperitoneum.

Conclusions The porcine bladder can be modified to allow its use as a reliable model for (IMIBS).

PS036P OUTCOMES IN BLADDER EXSTROPHY-EPISPADIAS COMPLEX FROM A SINGLE CENTRE OVER THE LAST THIRTY YEARS

D. CARROLL, C. KIMBER, N. McMULLIN AND J. H. KELLY

Royal Children's Hospital, Melbourne, Victoria, Australia

Purpose Exstrophy-epispadias complex is a rare condition and few series have reported the results of patients over long periods. We aim to demonstrate the results following surgery for exstrophy-epispadias from a single centre.

Methodology A retrospective case note review of patients operated on with bladder exstrophy, bladder exstrophy variant, cloacal exstrophy and epispadias between 1975 and 2005 was performed.

Results In the past thirty years 62 patients were treated with: classic bladder exstrophy (42), epispadias (13), Cloacal exstrophy (5), and bladder exstrophy variant (2). The number of patients treated increased over time with 9 patients in the first decade, 22 patients between 1985 and 1995 and a total of 31 patients from 1995–2005. In patients with classic bladder exstrophy 20/41 were incontinent of urine, 6 were continent with CIC, 14 were continent of urine and in 2 patients continence was not recorded. Renal function determined by blood urea and electrolytes was normal in 33/42 patients with classic bladder exstrophy.

In patients with epispadias 11/13 patients were continent of urine. All patients with classic bladder exstrophy required multiple secondary procedures (median = 5), although the median number of operations undergone by each patient has decreased over the last thirty years.

Conclusions Over the past thirty years changes in the operative approach to bladder exstrophy has resulted in a changing pattern of outcomes in our patients. Patients currently undergo fewer operations than in the past. Continence outcomes improve over time, as patients enter adolescence. Continence and renal function following surgery for epispadias is excellent.

PS037P APPENDICITIS IN THE PRESCHOOL CHILDREN: A DIAGNOSTIC & THERAPEUTIC CHALLENGE

S. Y. CHAO, K. K. W. LIU, B. P. Y. WONG, M. W. Y. LEUNG, K. W. CHUNG AND W. K. KWOK

United Christian Hospital, Hong Kong, China

Aim To review our experience with appendicitis among preschool children, and to determine the perforation rate of the appendix as well as its independent predictors and the effect on the patients' outcome.

Methods A retrospective case review was performed on all children younger than 6 years old who had appendectomy for appendicitis from January 1995 to September 2005.

Results In 10-year period, 57 eligible patients had a complete medical database. The mean age was 57.6 months and 30 were male. Mean duration of symptoms was 37.6 hours. Patients had medical consultation prior to hospital admission in 40.4% cases. Common presenting symptoms were abdominal pain (98.2%), fever (78.9%), nausea (75.4%) and vomiting (75.4%). The most common signs were temperature >38.5°C (59.6%), abdominal tenderness (98.3%) (localized 73.7% vs diffuse 24.6%) and guarding (89.5%). A preoperative ultrasound was obtained in 9 cases in which 6 had positive findings. Complicated (gangrenous or perforated) appendicitis occurred in 50.9% of cases. Predictors of complicated appendicitis were fever (P = 0.05), abdominal distension (P = 0.005) and diffuse abdominal tenderness (P = 0.004). Complicated appendicitis was significantly associated with prolonged ileus (P = 0.005) and longer hospital length of stay (P < 0.001). There was no death in this series. Laparoscopy was performed in 20 cases and 11 of them had to be converted.

Conclusion Delay in diagnosis and appendiceal perforation is common in children under 6 years old. Perforation results in a significant increase in postoperative ileus and length of hospital stay. Laparoscopic technique is feasible even for complicated appendicitis.

PS038P
COMPLICATIONS OF PEPTIC ULCERS IN CHILDREN AND ADOLESCENTS: MINIMALLY INVASIVE TREATMENTS OFFER FEASIBLE SURGICAL OPTIONS

S. Y. CHAO, K. K. W. LIU, B. P. Y. WONG, M. W. Y. LEUNG, K. W. CHUNG AND W. K. KWOK

United Christian Hospital, Hong Kong, China

Aim We report our series of children and adolescents undergoing minimally invasive treatments for bleeding or perforation complicating peptic ulcer diseases (PUD).

Methods From 1999 to 2004, consecutive patients below 18 years admitted with PUD complications were managed endoscopically for bleeding or laparoscopically for perforations were reviewed.

Results 107 patients with bleeding peptic ulcer underwent oesophagoduodenoscopy (OGD). 26 had significant endoscopic stigmata of recent haemorrhage (Forrest Ib or above). Haemostasis was achieved in all with endoscopic adrenaline injection +/- additional electrocautery. Re-bleeding was clinically suspected in four children, requiring further OGD. Only one had ESRH that warranted further endoscopic haemostasis. 12 patients with perforated peptic ulcer underwent laparoscopy. Nine children with small duodenal or juxtapyloric perforations had successful laparoscopic patch repair. Three were converted to open repair, one due to ergonomically interfering liver and two due to large ulcer size with friable tissue. All patients made uneventful postoperative recovery. There was no significant complication. 90% of these patients had *Helicobacter pylori* infestation. Triple therapy was given. Two patients defaulted triple therapy and presented later with recurrent bleeding.

Conclusions Peptic ulcer disease is common among children and adolescents in our locality and frequently presents with complications of bleeding or perforation. Endoscopic haemostasis is effective and safe. Laparoscopic patch repair for perforation can be a feasible surgical option. Eradication of *Helicobacter Pylori* is integral in managing peptic ulcer disease in children and adolescents.

PS039P
TOPICAL STEROID THERAPY FOR PHIMOSIS: A PROSPECTIVE DOUBLE-BLIND RANDOMIZED STUDY

S. Y. CHAO, K. K. W. LIU, B. P. Y. WONG, M. W. Y. LEUNG, K. W. CHUNG AND W. K. KWOK

United Christian Hospital, Hong Kong, China

Aim To evaluate the efficacy and safety of topical steroid in the treatment of phimosis.

Method Boys aged 3–17 with phimosis greater than Kikiro's grade 2 were recruited. Patients underwent double-blind randomization to steroid group (SG) or placebo group (PG). Topical 0.1% betamethasone or aqueous cream applied twice daily was offered for 4 weeks coupled with preputial retraction. At 5th week, steroid cream was given for 4 more weeks to both groups. Kikiro's grading was assessed at presentation, 5th, 9th and 25th week. Success was defined as Kikiro's grading.

Results 300 boys were randomly assigned to SG ($n = 149$) or PG ($n = 151$). Two groups were matched (mean age = 6.88; Kikiro's grading of SG = 3.68 vs PG = 3.73). 257 patients (SG = 129; PG = 128) completed the treatment. There was significant improvement in Kikiro's grading in both groups at 5th week (SG = K3.68 to 2.21, $P < 0.0001$ vs PG = K3.73 to 2.90, $P < 0.0001$) and at 9th week (SG = K2.21 to 1.66, $P < 0.0001$ vs PG = K2.90 to 1.70, $P < 0.0001$). At 5th week, down-grading was more marked for the SG group (success rate for SG = 76.5% vs PG = 50.5%, $P < 0.0001$). Although no statistical significance could be drawn, extra 8% SG patients benefited from topical steroid at 9th week (success rate for SG = 88% vs PG 80.4%). At 25th week, some boys had recurrence of preputial adhesions (SG = K1.66 to 2.14, $P = 0.044$; PG = K1.70 to 1.97, $P = 0.233$). There was no treatment complication.

Conclusion 8-week topical application of 0.1% betamethasone cream appears effective and safe in the treatment of phimosis. Preputial retraction contributes significantly in the success of treatment.

PS040P
THREE CASES OF HEPATIC MESENCHYMAL HAMARTOMA AND A REVIEW OF THE CURRENT LITERATURE

V. W. L. YU, J. W. CHEN, R. J. GENT, W. D. A. FORD AND H. L. TAN

Flinders Medical Centre, Adelaide, South Australia, Australia

Background Paediatric liver tumours can present as a diagnostic challenge. Hepatic mesenchymal hamartomas are rare and need to be distinguished from hepatoblastomas, as management and prognosis between the two are vastly different. Radiological imaging may be diagnostic. However in a proportion of cases, differentiation from hepatoblastoma may present a challenge.

Aim To report 3 cases of rare mesenchymal hamartoma and review the current literature.

Results Three cases of histologically confirmed hepatic mesenchymal hamartoma were diagnosed between 2001 and 2005. All were males aged between 12 days to 8.5 months presenting with abdominal distension and mass. One was diagnosed radiologically and confirmed on resection specimen. The second case had elevated alpha fetoprotein with non diagnostic imaging. The diagnosis was confirmed on histology after resection. These two underwent successful liver resection with no evidence of recurrence. Their tumours measured 9 and 14 cm in diameter and weighed 490 and 800 grams respectively. The third patient was diagnosed on needle biopsy and because of his young age is currently being observed.

Discussion Paediatric liver mesenchymal hamartoma can present as a diagnostic challenge. It is a benign tumour causing symptoms by virtue of its size. It is important to differentiate it from hepatoblastoma with vast different treatment and prognosis. Spontaneous regression of the tumour though rare has been reported.

PS041P
RENAL PARENCHYMAL INJURIES SECONDARY TO BLUNT ABDOMINAL TRAUMA IN CHILDREN – A RETROSPECTIVE REVIEW

M. J. MORRIS, A. BARKER, I. GOLLOW AND S. AHMED

University of Western Australia, Perth, Western Australia, Australia

Purpose A retrospective review of blunt abdominal trauma resulting in renal parenchymal injuries was undertaken for the period 1998–2005. The aim was to classify injuries that might require operative intervention versus conservative management.

Methodology A chart review was undertaken of the 45 cases. CT scan imaging enabled injuries to be classified into renal contusions, lacerations and transections. Mechanism of injury, clinical examination findings and length of hospital stay were recorded.

Results The median age of presentation was 11 yrs, with boys 3 times more likely to sustain renal parenchymal injury. Either kidney was equally involved. 40% were a result of a vehicle being involved in the mechanism of injury. 60% were the results of falls or playing sport. 25% of patients showed evidence of shock. 40% experienced vomiting with the injury, whilst 20% developed an ileus. For 6 of cases there was no radiological evidence of renal parenchymal injury, despite gross or micro haematuria on urinalysis. 17 were classified as renal contusions, 1 case requiring pyeloplasty at a later date. 12 were classified as renal lacerations, 1 undergoing lower pole nephrectomy. 8 were classified as transections, 6 of these proceeded to laparotomy. 2 were pedicle injuries.

Conclusions CT radiological findings are the most important predictor of the need for operative intervention in blunt renal parenchymal trauma. The classification of injuries by their radiological appearance into contusions, laceration and transections facilitates the decision making concerning operative intervention. 75% of blunt renal trauma classified as a transection required operative intervention within 6 months from injury.

PS042P
LONG-GAP OESOPHAGEAL ATRESIA (LGOA): 50 YEARS OF
EXPERIENCE AT THE ROYAL CHILDREN'S HOSPITAL,
MELBOURNE

J. C. PATTILLO, K. FERGUSON, J. CRAMERI AND A. AULDIST

Royal Children's Hospital, Melbourne, Victoria, Australia

Purpose To review the history and actual management of LGOA at RCH.

Methodology Retrospective review of a series of cases.

Results From 1949 to 2005, 810 patients with oesophageal atresia and/or tracheo oesophageal fistula have been admitted to the RCH. Sixty-six (8.1%) presented a LGOA. During the initial period (1949–1969) there was a high mortality and unsuccessful attempts of primary anastomosis, oesophageal replacement and palliative surgery. During the second period of the study (1970–1989) there was a tendency to perform primary anastomosis. Replacement with gastric tubes was a secondary treatment with variable degrees of success. Since 1990, 25 patients have been admitted with LGOA. Of this group 15 had a primary anastomosis and 5 had an oesophageal replacement with a primary gastric tube. The patients with LGOA had a high incidence of post operative complications including anastomotic leaking, strictures and gastro oesophageal reflux.

Conclusion The evolution in the treatment of LGOA has improved dramatically over the last years. While the optimal management for LGOA is still debated, the oesophageal replacement with a primary gastric tube is our preferred method of management when a primary anastomosis is not feasible.

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PERFORATION OF MECKEL'S DIVERTICULUM IN A CHILD
WITH ACUTE LEUKEMIA

S. L. TIEN, M. OSBORN AND C. KIRBY

Department of Paediatric Surgery, Women's & Children's Hospital, Adelaide, South Australia, Australia

We report a case of perforated Meckel's diverticulum in a 5 year old boy with febrile neutropenia. He presented on day 22 days post commencement of induction therapy for acute lymphocytic leukemia with acute abdomen and febrile neutropenia (White cell count-0.22, neutrophil-0.06). There was moderate abdominal distension with tenderness and peritoneal irritation over periumbilical and right side of abdomen. Ultrasound of abdomen noted bowel thickening of proximal ascending colon. An initial diagnosis of typhilitis was treated with tobramycin, cefepime and metronidazole. 48 hours after presentation he complained of increase abdominal pain and right-sided abdominal tenderness. Abdominal X-ray showed free intra-peritoneal gas. Laparotomy was performed for suspected colonic perforation secondary to typhilitis. However, perforation of a Meckel's diverticulum was discovered at operation.

The development of acute abdomen pain and tenderness in children following chemotherapy may be seen in association with appendicitis or typhilitis. This commonly arises during a period of neutropenia. Perforation of the colon, jejunum and appendix has been recorded. Herein we report a case of perforated Meckel's diverticulum as a cause of 'the acute abdomen' in a neutropenic child. We discuss the management of children with neutropenia who develop abdominal pain, with reference to differential diagnosis, helpful investigations and indications for surgery.